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No. 8.

ORIGINAL COMMUNICATIONS.

(Original Communications are received with the understanding
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DIAGNOSIS AND TREATMENT OF SYPHILITIC AFFECTIONS OF THE ACOUSTIC NERVE, WITH SPECIAL REF- ERENCE TO THE USE OF SALVARSAN.*

DR. GEORGE E. DAVIS, New York City.

Within the last decade great advances have been made in elucidating the physiology and pathology of the eighth nerve and its end-organs. That Barany has been the master mind in this field is amply attested by the recent award to him of the Noble prize. Without question, contemporaneous progress has been made in other fields of medicine, particularly in sero-diagnosis, serotherapeutics and chemotherapeutics. Schaudinn, by isolating the spirochete pallida, Wassermann by perfecting his complement fixation reaction test, and Ehrlich by devising salvarsan probably have conferred the greatest boon of this generation on the profession and humanity in the scientific diagnosis and treatment of syphilis in its protean manifestations.

Diagnosis. With the recent renewal of interest, initiated by the investigations of Barany and other leading otologists, in the effort to solve various physiological problems of the acoustic mechanism and to facilitate accurate and scientific diagnosis and treatment of pathological conditions where disease has invaded the ear, particular attention has been directed to those cases associated with syphilis, especially those treated with salvarsan.

As you are well aware, since the advent of salvarsan as a panacea in lues, apparently there has been a marked increase in the fre-

*Read before the American Laryngological, Rhinological and Otological Society, at White Sulphur Springs, W. Va., May 5, 1916.

quency and severity of inflammatory reactions of the eighth and other cranial nerves. In the meantime there has been much discussion as to the nature and etiology of these reactions—whether due to the toxins of the spirochete pallida or to the toxic effect of the salvarsan. This disputed question we will refer to later. At present we wish to consider some early clinical diagnostic signs of syphilis as manifested in disturbances of the acoustic functions. Preliminary even to the period at which we may expect the positive Wassermann, that is, a month to six weeks following infection and previous to the appearance of any general symptoms, the otologist, by careful functional tests of the ear, is able in a majority of cases to arrive at an early diagnosis of syphilis.

Clinical signs—shortened bone conduction. A definite and often marked shortened bone conduction is almost always present in the initial primary stages of lues, notwithstanding that air conduction remains practically normal, particularly for the lower tones, provided there are no middle-ear complications from other causes. So constant, in fact, is this shortening, when tympanic conditions can be excluded, that it is regarded by some authorities as characteristic, if not pathognomonic, of lues, especially in the primary and secondary periods of the acquired type. It is also present not infrequently in hereditary syphilis.

Willcutt¹ cites Wanner and Oscar Beck as pioneers in the recognition of the great importance of this clinical sign, but credits Crockett with an earlier report of this condition though the latter failed to emphasize its clinical significance, contenting himself with calling attention to the relatively normal air conduction, notwithstanding the complete absence of bone conduction in the three cases reported. The amount of loss of bone conduction in these syphilitic cases varies greatly, ranging from a few seconds to almost total loss. For this reason the significance and reliability of the test has been questioned by some who claim that the age of the patient and the structure of the mastoid bone (whether pneumatic or sclerosed) may account for considerable variations in the bone conduction. Clinical experience, however, as evidenced by the reports of many investigators, has confirmed the earlier claims and demonstrated marked difference in the relative bone conduction in syphilitic and non-syphilitic cases. Willcutt¹ reports the findings of his examinations in about three hundred syphilitic cases in Urbantschitsch's Vienna clinic. In this series of cases there were fifty-eight cases of a month's duration or less. Fifty-two of these fifty-eight cases showed a definite shortening in the bone conduction though he was careful to exclude all

other conditions that might be responsible for the reduction. In six of these fifty-eight cases there was no diminution of the bone conduction. It is a fair deduction, judging from such reports, that in the primary stages of lues we may expect a definite reduction of the bone conduction in about 90 per cent of the cases. My experience certainly tends to corroborate the above high percentage.

Plus Rinne. With shortened bone conduction, the air conduction remaining nearly normal, we usually get a strong, positive Rinne in the early stages of syphilis. Should an acute middle-ear condition complicate, the previously lowered bone conduction may be elevated, but seldom to or beyond the "normal point." With the subsidence of the acute middle-ear trouble, the bone conduction returns to its original low level.

Theories of the causation of the lowered bone conduction. Two theories have been advanced to explain this condition. O. Beck² contends that it is due to an increased cerebrospinal pressure. Willcutt, Knick and Zaloziecki³ and others believe it is due to a toxic irritation or degeneration of the acoustic nerve. A combination of these causes, I believe, is a more plausible theory as to the etiology of this condition in a majority of the cases.

Beck bases his theory on his observation that following lumbar puncture in syphilitic cases the shortened bone conduction tends immediately, or soon, to resume the normal, but in a few days, with the return of the increased cerebrospinal pressure, it is gradually lowered again. That the increased cerebrospinal pressure may be a factor in the etiology of the lowered bone conduction in many cases, particularly in the secondary stages, hardly admits of doubt. The plausibility of this contention is augmented by the familiar and easily demonstrated effects of the reduction of the bone conduction in normal ears in performing the Gelle test. In the latter instance, of course, the counter pressure comes from without and is exerted indirectly through the drum. My experience in making functional tests in luetic cases confirms Beck's theory to the extent that the shortened bone conduction revealed by the Schwabach test is further reduced by the pressure occasioned by the Gelle test, provided there has been no fixation of the stapes, etc., by middle-ear complications.

Willcutt questions the plausibility of Beck's theory on the ground of the short duration of many of these cases of very early syphilis in which reduced bone conduction is present, the diagnosis of which has been authenticated by the demonstration of the spirochete pallida from smears of the primary lesion and a positive history of

infection. The argument is advanced that a syphilitic meningitis has not time to develop to a sufficient extent to produce a cerebro-spinal pressure adequate to materially lower the bone conduction. And when we consider that shortened bone conduction is an initial and almost constant symptom of lues, occurring as early as the eighth day, we are inclined to the opinion of Willcutt and others in the toxic theory. The basis of the latter theory in causing early shortening of bone conduction is that the toxins and endotoxins of the spirochete circulating in the blood affect primarily the most sensitive tissues—the brain, meninges, cranial nerves, etc.—which accounts for the early lesion of the acoustic, the meningeal headaches, and other “increased nerve reflexes” which frequently occur in the initial primary stages of syphilis. Therefore, given a shortened bone conduction, which is definite and marked in 90 to 95 per cent of syphilitic cases, even in the primary stages, with the air conduction remaining practically normal unless there has been or exists a middle-ear complication, a positive Rinne is a necessary corollary and a strong confirmatory test to the specificity of the auditory lesion. Kerrison,⁴ while conceding the diagnostic value of lowered bone conduction in these cases, differs from most authorities in his findings in the Rinne test, claiming it is negative, particularly in the latent stages. The following functional hearing tests may be regarded as strongly diagnostic of early syphilis:

1. Bone conduction definitely shortened.
2. Rinne positive.
3. Air conduction—low notes, relatively normal—high notes definitely lowered.
4. Bilateral affection.

However, in the advancing stages of syphilis the focal aural lesions may become suddenly augmented as evidenced by more or less intense and abrupt manifestations of an acute auditory neuritis. When the cochlear branch alone is involved, and it is usually the first to suffer, there is severe, constant tinnitus which is accompanied or soon followed by impairment of hearing varying in degree, from time to time, from slight to total deafness. If the invasion extends to the vestibular branch, which it usually does after a brief interval, the above acoustic disturbances are supplemented by even more distressing static disturbances, as vertigo, dizziness, nausea, vomiting, disturbed equilibrium, great prostration, etc.

To summarize, at this juncture, I would emphasize some important phenomena in the differential diagnosis of specific eighth nerve neuritis and inflammatory or suppurative labyrinthitis. The most

characteristic of these are the marked variations, often from day to day, both of the acoustic and the static manifestations in specific neuritis, together with the incidence that the severe attacks are frequently preceded by one or more milder attacks, whereas in inflammatory labyrinthitis the first attack is most severe and the acoustic and static symptoms are coincident, and remain permanent, or gradually ameliorate. Moreover, in specific neuritis not infrequently there is a short interval between the acoustic and static symptoms which is accounted for by reason of the greater vulnerability of the cochlear branch to the luetic toxin, therefore it is usually affected first. Wintermute⁵ explains the great variations of hearing in specific auditory neuritis as follows: "When the infiltration of the nerve is great, many of the fibres are incapacitated by pressure, and the patient hears badly; on other days the infiltration is absorbed, the pressure is reduced, and those fibres which are not degenerating recover their function, and the patient hears much better."

The vestibular branch reactions are of the labyrinthine type, and are equally or more vacillating than the acoustic, and their great variations probably may be explained by the same mechanism. The turning reaction is usually the first to go, the caloric following. However, one may be present and the other absent. Occasionally the labyrinth is so sensitive that it responds to the fistula test. Hill Hastings⁶ reports a case of hereditary syphilis of this type.

Treatment. The value of serum and vaccine diagnosis and therapy in many of the infectious diseases is now universally acknowledged, thanks to the distinguished services of Pasteur, Koch, Behring, Wright, Wassermann, Ehrlich, Flexner, Nogouchi, Dwyer and many other investigators working in bacteriological and immunological fields. The Wassermann reaction as applied to syphilis, is a brilliant example of the practical worth of serological *diagnosis*, but unfortunately, to date, we have no biological *therapeutic* product of equal value to heal this dreadful scourge. All hail, then, and all the more opportune Ehrlich's epoch-making discovery of a "therapia sterilizans magna," a *chemotherapeutic* product—salvarsan—which in the great majority of cases acts as a specific in the active immunization and cure of syphilis. But since the introduction of salvarsan in systemic specific therapy, unfortunately, perhaps unquestionably, there has been a relative increase in the frequency and severity of the focal reactions or so-called "neurorecidives" heretofore observed in the acoustic, facial and other cranial nerves, in syphilitic cases.

And this brings us to the consideration of the paramount question whether these focal reactions, or at least their greater fre-

quency and increased severity may be imputed directly to the toxic action of the salvarsan, or only indirectly to the provocative effect on the entrenched spirochetes in their respective foci, i. e., a provocative focal specific reaction similar to the provocative general specific reaction, indicated by the return of a positive Wassermann, sometimes observed in the administration of mercury, salvarsan or other antiluetic therapy.

A clear comprehension of this question can be obtained only by an analysis of the action of the *treponema pallidum* on the various tissues of the body in conjunction with the therapeutic mechanism of salvarsan in ridding the individual of this organism and its endotoxins. The literature abounds in citations of case reports relative to the frequency and severity of early syphilitic involvement of the acoustic nerve, both prior and subsequent to the use of salvarsan. The investigations of Benario, Habermann, Mayer, Frey, Riguard, Politzer and others show the not infrequent occurrence of syphilitic focal reactions or neurorecidives before the discovery of salvarsan. And, moreover, large clinical experience has shown that since the introduction of salvarsan it has been efficacious, if properly administered, in clearing up the focal lesions. Nevertheless, O. Beck, Finger, Alexander, Urbantschitsch, contend that the administration of salvarsan in luetic cases is not without danger, particularly if there is co-existent an inner-ear inflammation. Whether salvarsan therapy may be provocative rather than preventive and curative of this auditory lesion, occurring more or less frequently in the primary and secondary stages of syphilis, is still a mooted question which, finally, must be settled, I believe, by further studies and investigations along immunological lines, together, of course, with clinical experience. An elaborate discussion of immunology and therapy cannot be undertaken here, but a synopsis of salient features may not be out of order.

The mechanism of salvarsan therapy in syphilis is that of a vaccine. The mechanism of vaccine therapy in infectious diseases, as you well know, is based on nature's method of combatting pathogenic organisms invading the body. Wright has informed us that nature's way of resisting these organisms is through the opsonins normally present in the blood stimulating the phagocytes to the formation of antibodies which are antitoxic to that class of bacteria which secrete soluble toxins, and are bactericidal and bacteriolytic to that class of bacteria which elaborate within themselves endotoxins, the liberation of the latter in the circulation and the body tissues, however, being contingent on the destruction of the bacteria. The spirochete pal-

lida belong to the latter class. Dwyer⁸ emphasizes the point that these endotoxins are not necessarily and usually are not neutralized by the vaccines which liberate them. In view of the latter incidence, we would expect during the treatment of infectious diseases by vaccine therapy more or less decided and even violent reactions—general, focal and local, due directly to and dependent upon the character and amount of toxins introduced or freed. This is only too aptly illustrated in the tuberculin vaccine therapy of tuberculosis. The analogy may be applied to salvarsan therapy in syphilis. And since Ehrlich and Plaut have demonstrated that salvarsan has no tropic effect on the spirochete outside the body, we must conclude that when it is administered intravenously it forms with the blood plasma a biochemic product, or a biochemic vaccine if I may so designate it, which is bactericidal and bacteriolytic to all the spirochetes in the circulation or in tissues or foci accessible to the circulating media. The immediate results following this wholesale destruction of the spirochetes, with the liberation of their endotoxins are more or less decided general or systemic reactions and occasionally focal reactions. The former reactions are indicated by malaise, rise of temperature, chilliness or rigors, headache, nausea, vomiting, cramps, etc., while the latter reactions are evidenced by a disturbance or destruction of the functions of the organs or tissues in which the *treponema pallidum* may have a local habitation.

Etiologically, according to Thomas and Ivy,⁹ these clinical general reactionary effects of salvarsan therapy in syphilis "probably occur by virtue of two facts: Firstly, the endotoxins arising from the destruction of myriad numbers of spirochetes, and, secondly, to the toxic effect of arsenic itself, based on personal idiosyncrasies." The clinical focal reactions may be regarded as Herxheimer reactions which, according to the same authorities, are defined "as any inflammatory reaction in syphilitic tissue provoked by the administration of salvarsan, neosalvarsan or mercury." Focal reactions probably occur by virtue of one factor—the direct action of the luetic endotoxins. These are freed either in the circulating media and conveyed by them to the seats of the focal reactions, else they are freed at the seats of the focal reactions. Therefore, salvarsan, or rather the non-toxic biochemical product it forms with the blood plasma to destroy the spirochaetae and liberate their endotoxins, is only indirectly causative of the focal reactions. Moreover, Ehrlich's laboratory experiments with injections of salvarsan in animals and examination of the nerves microscopically afterward, convinced him that salvarsan had no direct or selective toxic or neurotropic

action on the nerves. His theory as to the etiology of focal reactions or so-called "neurorecidives" following the injections of salvarsan in syphilitic cases is that while the spirochetæ in the general circulation are easily accessible to the tropic influence of the drug, those located in nerves may escape on account of the restricted vascularity—and the spirochetæ focussed in these points multiply rapidly, cause infiltration and swelling of the nerves which, if confined in narrow, bony canals as the eighth, seventh and some other cranial nerves, are subjected to the counter-pressure of these bony walls with the consequent disturbance or loss of nerve function. In case of a coaffection of several of the cranial nerves we get a syndrome designated as the Frankl-Hochwart's disease, or a polyneuritis cerebrealis.

The occurrence then, of focal reactions in the acoustic, facial or other cranial nerves during the course of salvarsan therapy, in syphilitic cases, is no incrimination of this remedy directly, but rather an indictment of the technique of administration. Either the dose has not been sufficiently large, else not repeated sufficiently often and continued sufficiently long to completely destroy all the spirochetæ pallida, particularly those in avascular foci—as nerve tissue, or in other foci or recesses difficult of access—as the cerebrospinal fluid. When properly given we may safely acquit salvarsan of producing neurotropic lesions, as "neurorecidives," but we cannot emphasize too strongly that its safety and efficiency in preventing and curing such syphilitic lesions depend upon its timely and intelligent administration, controlled by repeated examinations not only of the blood but of the cerebrospinal fluid.

Report of cases. The appended case reports are fairly typical of the acoustic clinical manifestations and focal reactions occurring in syphilitic cases, particularly those that have been neglected or inefficiently treated.

Case I. Mr. T. E. B., age 31, was referred November 10, 1915, on account of almost total deafness. The following history was elicited. He noticed chancre July 1, 1914. His local doctor gave him pills, perhaps protiodide mercury, for about one month. Following this he had mercury injections twice a week until May 1, 1915. In the meantime he had two injections of salvarsan, the first late in November, 1914, and the second late in January, 1915. First Wassermann was made in February, 1915, during treatment which, of course, proved negative. All treatment was suspended May 15, 1915. June 30, 1915, he suffered a left facial paralysis and total deafness on that side. At the time he was very dizzy, had difficulty

in walking and was compelled to keep his head straight forward to avoid falling. In two or three weeks the facial paralysis had about cleared up, the dizziness disappeared and the disturbed equilibrium readjusted itself. July 15 he suffered total loss of hearing in the right ear. From this date he resumed treatment with mercury bichloride grs. 1/10 t. i. d. in combination with kali iodid, beginning with grs. V. and increasing doses up to grs. XL. t. i. d. This was continued till I saw him November 10, 1915.

Functional ear tests at that date revealed the following acoustic and static conditions. With noise apparatus in right ear—total deafness in left ear. The low note for fork in right ear was small E (2) and the high note was 5.9 Galton. There was no spontaneous nystagmus. Turning ten times to left, with head inclined forward 60°, produced rotatory nystagmus to the right for 12 seconds. Turning ten times to right, with head inclined forward 60°, produced rotatory nystagmus to left for 15 seconds. The caloric tests proved negative to heat of 118° F. Cold in the right ear produced violent nystagmus to the left of 1 m. and 50 seconds' duration; and cold in the left ear produced nystagmus to right for 1 m. and 3 seconds.

Further treatment of this case by a competent syphilographer, though strenuous, was unsuccessful, only a slight improvement in the hearing was effected and this but temporary.

This case clearly illustrates the ill effects of delayed and inefficient treatment and the nonresponsibility of salvarsan in causing the neurorecidives. It was five months after the initial lesion before the first salvarsan injection and seven months before the second. It was five months after the second salvarsan before the occurrence of focal lesions in the seventh and eighth nerves on the left. The local lesions in the right ear followed two weeks later. In fact, all treatment had been suspended six weeks prior to the focal ear lesions. As salvarsan is rapidly eliminated from the system it could in no wise be responsible, directly or indirectly, for the focal ear lesions in this case. In fact, had salvarsan been given promptly in adequate dosage I am satisfied his ear lesions would never have occurred.

Case 2. This case is cited to illustrate the significance of shortened bone conduction as a reliable diagnostic sign of lues. Miss M. B., age 23, a stenographer, was referred December 22, 1915, on account of an anterior subluxation of the septal cartilage obstructing nasal breathing on the left. She said she had been troubled with catarrh as long as she could remember and for some time had noticed some stuffiness in her ears. It occurred to me that the latter symptoms were due indirectly to the nasal obstruction and that the

correction of this would relieve the middle-ear complication. However, this hoped-for result did not occur. A careful functional test revealed, to my surprise, a marked reduction in the bone conduction—18 sec. in the right and 14 sec. in the left, notwithstanding the mild middle-ear catarrh. This aroused my suspicion of lues and I went into her family history. Father died at the age of 68 from apoplexy; mother died at the age of 52 from cancer, but had suffered a right facial paralysis three years before her death. She has two brothers, both healthy; one younger sister, 19 years old, has a goitre. Her personal history, as regards lues, according to patient's statement, is negative. She had a left facial paralysis two and a half years ago and for three days preceding the facial paralysis she had twitching of the facial muscles on the left, was dizzy and had difficulty in walking. Following the facial paralysis she had about a week's treatment with a "salty solution" and this with massage cleared up the paralysis in about six weeks. She complains of extreme fatigue and for the past six or seven years has been troubled with somnolence—nodding, sometimes she says, while taking dictation. Her general appearance is good. However, the shortened bone conduction, in spite of the middle-ear catarrh, taken in connection with the history of the left facial paralysis and her somnolence, induced me to refer her for a Wassermann which, not to my surprise, proved three plus. The diagnosis of lues was returned.

Other reports could be cited from my case books but these are sufficient to illustrate the claims of the text.

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**FURTHER STUDY OF THE TUMORS OF THE UVULA—CON-
SIDERING THEIR FREQUENCY, MALIGNANCY, AND RE-
CURRENCE WITH A REPORT OF ONE ADDITIONAL
PAPILLOMA, (EXCLUSIVE OF ANGIOMA).***

DR. P. SAMUEL STOUT, Philadelphia, Pa.

These tumors are considered with the endeavor to determine the percentage of malignancy and recurrence. A great many authors have given no data, and comparatively few of the cases were followed up for any length of time. An exhaustive study such as this shows the necessity for giving complete data in our reports of cases. If the data were complete in all of the cases mentioned, the conclusions would be very valuable.

I will take up first carcinoma of the uvula. A search of the available data covering the past fifty years discloses a total of nine cases of carcinoma of the uvula, but three of which were reported in detail. I will give a brief resume of those reported in detail:

In 1902, C. F. Raynor¹ reported a case of malignant growth of the uvula. The patient was a man 66 years of age. The case was seen the third month after symptoms were first noticed. He complained of a constant irritation of the throat and inability to sleep except when lying on the right side. Six months previous the patient had an attack of grip, followed with increasing throat-trouble ever since. No history of malignant disease. The patient was otherwise in good health. He stated that he had an operation on the uvula 35 years ago, and 15 years ago had had an antral suppuration.

"Examination showed an edematous uvula with an inflamed mass behind, connected to the posterior surface of the uvula, its upper margin terminating on a line with the velum, extending about a quarter of an inch on each side, and about half an inch below the tip of the uvula, the whole forming a flat, cylindrical mass about one inch long and three-quarters of an inch wide and half an inch thick, slightly eroded at the tip. There was no interference with swallowing or phonation.

The growth was excised and the patient was seen at intervals of two weeks after the operation. There were no symptoms until October, when he contracted a cold which was followed by a general inflammation of the pharynx. The usual treatment gave no relief. There was severe pain referred to the base of the tongue and larynx. On December 6 I discovered a small, fungous growth to the left of

*Read before the Philadelphia Laryngological Society, April 4, 1916.

the site of the operation, growing downward from the velum. Four days later a localized swelling appeared on the hard palate, to the right of the median line about one-half inch in diameter, with an erosion extending downward from the growth. He is now under treatment with the x-ray.

Malignant neoplasms in this locality are very rare. In five years' experience in the Brooklyn Eye and Ear Hospital, embracing 14,000 cases, I have not encountered a single instance."

In 1905, Friedman² reported a case of carcinoma of the uvula. The patient was a man 49 years of age. Six years previous, the patient had been operated on for a "swelling in the throat" the nature of which he did not know.

"Seven weeks ago the patient noticed pain on swallowing and slight cough. A few days ago he said he noticed a change in the appearance of the uvula, and there was very great pain on swallowing, for which he consulted me."

Examination showed the uvula as large as a berry, reddish-yellow in color, swollen and inflamed. There was no swelling of the adjacent glands. The growth was excised and microscopic examination showed it to be carcinoma. The writer does not state the length of time since operation.

In 1907, C. F. Theisen³ reported "A Case of Primary Carcinoma of the Uvula." The patient was a man 52 years of age. He said he had noticed a growth in the throat for three months previous. There was slight pain, radiating to the ears, and difficulty in swallowing. The growth was confined to the uvula. His family history was excellent. The growth was excised fourteen months previous to this report, and the patient has gained thirty pounds since and is in excellent condition now. No sign of a recurrence.

In 1910, E. M. Holmes⁴ reported a carcinoma of the uvula. The patient was a man, but the age is not given.

"The patient states that eight months previous he noticed a numb feeling in the uvula and palate. It was sore, but not painful. After a few weeks the uvula became red and swollen. He then consulted his family doctor, and was treated locally and systemically. When I saw him the uvula was gone, leaving granular ulcerations surrounded by a nodular growth extending over the soft palate and left faucial pillar. There was no swelling of the deep glands. Two months after operation, a swelling appeared behind the sternomastoid. Incision was made and considerable pus evacuated. A week later erysipelas developed. He recovered from the erysipelas, but shortly the entire right side of the neck was involved, with great pain. He can take but little nourishment, and at this time (April, 1910) he is nearing the end."

There were other cases reported of carcinoma of the uvula, the data of which I was unable to obtain, as follows: 1893, Newman, 1 case; 1899, Zurakowski, 1 case; 1899, Lennox-Brown, 1 case; 1904, Yamagami, 1 case; 1908, Pieniazek, 1 case; 1913, Trusoff, 1 case.

In the cases reported in which data was given, two out of the three recurred. One recurred within a year, the other within two months after operation. In one which did not recur, the time is not definitely given since operation.

Combining the cases reported in detail and those reported without data give a total of nine cases of carcinoma of the uvula reported during the last fifty years.

Taking up epithelioma, in 1901, Oppenheimer⁵ reported a case of epithelioma of the uvula in a man aged 81 years. "A few weeks ago the patient noticed a thickening at the tip of the uvula, which rapidly increased to the size of a walnut, bluish-red in color, not ulcerated. The patient had slight pain, radiating to the ears. Microscopic examination showed epithelioma. No operation was performed on account of the patient's age.

In 1902, J. F. McGaw⁶ reported a case of primary epithelioma of the uvula in a woman, aged 37. In this case the patient was in good health until eight months ago, when a slight throat irritation developed. About six weeks ago the uvula showed enlargement. There was swelling of the soft palate, pain, difficult deglutition, alteration in the voice and soreness in the cervical muscles. The tumor was excised, and microscopic examination showed epithelioma. After operation the patient improved in health, developing from a weak, anemic individual, to a healthy, robust woman.

Her family history disclosed that one sister had died following an operation for removal of an abdominal tumor, the nature of which she does not know, and another sister is now suffering from an obscure abdominal growth.

It is five years since the operation, and there is no evidence of recurrence.

In 1905, Harmon Smith⁷ reported a case of epithelioma of the uvula in a man 51 years of age. In this case the patient had noticed dryness of throat and difficulty in swallowing for a year before. Examination showed a strawberry-like mass on the uvula, extending to the soft palate. There was submaxillary involvement, but no involvement of the cervical glands.

The growth was removed, and within a few weeks, nodular growths appeared in the surrounding tissue. These were removed, and later another operation was required. It is five months since

the last operation, and the site of operation has healed nicely and there is no sign of further involvement. The patient has gained nearly 30 pounds since the last operation.

In 1908, W. Milligan⁸ reported a case of epithelioma of the uvula in a man aged 62. The author states that the patient made an uninterrupted recovery, but gives no other data.

In 1909, Van Meenan⁹ reported a case of epithelioma of the uvula in a man aged 72. The patient consulted the physician for pain in the throat and difficulty in swallowing. Operation was performed with the thermo-cautery. No further data is given.

In 1909, W. Downie¹⁰ reported a case of epithelioma of the uvula in a man aged 56 years. The patient was first seen in July, 1897. Had suffered with sore throat for two months. Pain on deglutition and difficulty in swallowing. Snored loudly at night and frequently awakened with a sense of suffocation. The voice was not affected.

Examination showed the uvula much enlarged, ulcerated, and the tip was raw. There was a large, ulcerated mass near the base. Slight manipulation caused bleeding. There was no involvement of the neighboring glands. Operation was performed and the recovery was apparently complete, but ten years later the patient came back with a large, malignant tumor of the neck. He died a few months later in the cancer hospital.

In 1909, W. Downie¹¹ reported a case of epithelioma of the uvula in a female, aged 41 years. Patient complained of difficult deglutition. Examination showed the uvula thick and flattened. It was hard to the touch and slight manipulation produced bleeding. The growth was removed, and four years later the patient returned with a growth on the left tonsil. This was removed and examination showed it to be scirrhus.

In 1909, W. Downie¹² reported a case of epithelioma in a man 64 years of age. Three months previous the patient noticed a sticking sensation in the back of the throat on swallowing. Five weeks before admission he began to have pain along both sides of the jaw, extending to the temporo-maxillary articulation. Examination showed the uvula thickened and flat, and slight manipulation produced bleeding. The surface was ulcerated and granular. The growth was removed five months ago and there is no sign of recurrence.

In 1915, J. G. Parsons, of Sioux Falls, S. D., in a letter to the writer, reported a case of epithelioma of the uvula. He stated that the patient, a man aged 37, had no symptoms except difficult deglutition. Examination showed a nodule about 5 mm. in diameter at the root of the uvula. Microscopic examination showed a typical

TUMORS OF THE UVULA

Com

| Year Reported | Growth Began | Nature of Tumor | Prim. | Age | Sex | When Seen | Operation 1 2 3 | Recurrence | Length of time since operation | |
|---------------|--------------|-----------------|-------|-----|-----|-----------|--------------------|------------|--------------------------------|-----------------------------|
| 1858 | 1857 | Pap. | yes | 38 | M | 2nd yr. | 1 | no | ? | Vida par une Soc. A |
| 1880 | ? | Pap. | yes | 32 | M | early | 1 | no | ? | Risler (1879-1 uvula; |
| 1886 | 1884 | Pap. | yes | 60 | M | 2nd yr. | 1 | no | ? | Kleib Uvula, 1886, 2 |
| 1887 | ? | Pap. | yes | 30 | M | early | 1 | no | ? | Fren 1887, 2 |
| 1891 | 1891 | Pap. | yes | 23 | F | early | 1 | ? | two days | Prot Bull. S p. 228. |
| 1896 | ? | Pap. | yes | 70 | M | ? | 1 | no | ? | Labl Hebdon de Rhl |
| 1901 | same yr. | Epith. | yes | 81 | M | early | | ? | ? | Opp thellon 1901, |
| 1902 | 1901 | Carci- noma | yes | 66 | M | 3rd mon. | 1 | yes | 14 mos. | Ray Growth scope, |
| 1902 | 1901 | Epith. | yes | 37 | F | 8th mon. | 1 | no | 5 years | McC of Uv Lar., 1 |

| | | | | | | | | | | | |
|------|------|---------------|-----|----|---|----------|-------|---|----------|---------------------------|-----------|
| 1903 | ? | Prob. Fibroma | yes | 4 | F | early | 1 | no | ? | Cour. XI, p. | |
| 1905 | ? | Carci- noma | yes | 49 | M | 2nd mon. | 1 2 | no | ? | Frie Berlin | |
| 1905 | 1904 | Epith. | yes | 51 | M | 2nd yr. | 1 2 3 | no | 5 mons. | Smithellon Place M. J., | |
| 1906 | 1905 | Pap. | yes | 20 | M | 2nd yr. | 1 | no | 4 mons. | Berr Uvula, 767. | |
| 1907 | 1906 | Carci- noma | yes | 52 | M | 3rd mon. | 1 | no | 14 mons. | Thel Carcin Lar., 1907, 2 | |
| 1907 | 1892 | Fibroma | yes | 28 | M | 2nd yr. | 1 | no | 13 years | Perr Archiv 1907, 1 | |
| 1907 | 1901 | Pap. | yes | 31 | M | 1902 | 1 | no | ? | Perr Archiv 478. | |
| 1908 | ? | Epith. | yes | 62 | M | early | 1 | no | ? | Mill Uvula, Lar. S | |
| 1908 | ? | Pap. | yes | 14 | M | early | 1 | no | ? | Hals 1908, 1 | |
| 1909 | ? | Epith. | yes | 75 | M | ? | 1 | no | ? | Van luette, 1909, 1 | |
| 1909 | ? | Pap. | yes | 20 | F | early | 1 | no | ? | Van luette, 1909, 1 | |
| 1909 | 1897 | Epith. | yes | 56 | M | 2nd mon. | 1 | No recurrence in uvula or soft palate, but 10 yrs. later came | | | Dow LXII, |

A REPORTED DURING THE LAST FIFTY YEARS

Compiled by Dr. P. S. Stout, Philadelphia

| Reference | History and Remarks |
|---|---|
| Vidal, (Tumeur de la luetite formee par une hypertrophie papillaire), Bull. Soc. Anat. de Par., 1886, XXXIII, 227. | About eighteen months before noticed dryness of throat, causing constant swallowing; also a disagreeable, tickling sensation in throat. Examination showed the uvula elongated, and a tumor on the end $1\frac{1}{2}$ c.m. long and 1 c.m. wide. The tumor was excised and the symptoms promptly disappeared. |
| Risley, S. D., Tr. Path. Soc., Phila., (1879-1881) "Growth pendant from uvula; no symptoms." | No data given. |
| Kleinschmidt, C. H., "Papilloma of Uvula," J. A. M. A., Vol. VI, No. 10, 1886, 272. | Tumor on left side of uvula. Easily removed. The patient, who was a minister, had had trouble in using his voice for two years previous. |
| French, W. J., Med. Rec., N. Y., 1887, XXXII, 813. | Patient says he has had a sore spot in throat as long as he can remember. This annoyance was further complicated by vomiting whenever he passed directly to the open air after eating. For years he has had a sharp, hacking cough. Examination showed, hanging from the tip of the uvula and descending to the right, a body over one inch in length, beginning with a small pedicle and widening to a base, circular in form, and flat from before backward. The location is my only excuse for reporting it. |
| Protherat, E., Papillome de la luetite, Bull. Soc. Anat. de Par., 1891, LXVI, p. 228. | Patient says that lately she has had difficulty in swallowing and talking. Examination showed a tumor on the uvula 2 c.m. high, 2 c.m. long and 1 c.m. wide at base; higher on the right side than on the left. Excision, with prompt disappearance of symptoms. |
| Labit, Papillome de la Luetite, Revue Hebdomadaire de Laryng. d' Otol. et de Rhin., Paris, 1896, XVI, pt. 2, 961-3. | Patient complains of sneezing and frequent expulsion of mucus from throat; snores at night; frequently has pain in throat. Examination shows pharynx coated with yellow mucus, dry and sticky; uvula elongated; small, round tumor at extremity the size of a lentil; color, pale pink dotted with red. |
| Oppenheimer, S., "Primary Epithelioma of Uvula," Med. Rec., N. Y., 1901, Vol. X, 215. | A few weeks ago patient noticed thickening at tip of uvula, which rapidly increased to size of a walnut; bluish red in color, not ulcerated. Patient had slight pain, radiating to ears. Microscopic examination showed epithelioma. No operation on account of patient's age. |
| Raynor, C. F., "A Case of Malignant Growth of the Uvula," The Laryngoscope, St. Louis, 1902, XII, p. 109-111. | Patient complained of constant irritation of throat; inability to sleep except when lying on right side. Six months ago patient had an attack of grip, followed with throat trouble, with increasing discomfort ever since. No history of malignant disease. Patient in good health otherwise. Had operation on uvula 35 years ago; 15 years ago had antral suppuration which was cured through alveolar puncture. Examination showed an edematous uvula, with an inflamed mass behind, connected to the posterior surface of the uvula, its upper margin terminating on a line with the velum, extending about a quarter of an inch on each side, and about one-half inch below the tip of the uvula, the whole forming a flat, cylindrical mass about one inch long and three-quarters of an inch wide and half an inch thick; slightly eroded at the tip. No interference with swallowing or phonation. The patient was seen at intervals of two weeks after operation. No symptoms were followed by a general inflammation of the pharynx. The usual treatment gave no relief. Severe pain, referred to the base of the tongue and larynx. On December 6, I discovered a small, fungus growth to left of site of operation, growing downward from the velum. Four days later a localized swelling appeared on the hard palate to the right of the median line about one-half inch in diameter, with erosion extending downward from growth. He is now under treatment with the x-ray. Malignant neoplasms in this locality are very rare. In five years' experience in the Brooklyn Eye and Ear Hospital, embracing |

was followed by a general inflammation of the pharynx. The usual treatment gave no relief. Severe pain, referred to the base of the tongue and larynx. On December 6, I discovered a small, fungus growth to left of site of operation, growing downward from the velum. Four days later a localized swelling appeared on the hard palate to the right of the median line about one-half inch in diameter, with erosion extending downward from growth. He is now under treatment with the x-ray. Malignant neoplasms in this locality are very rare. In five years' experience in the Brooklyn Eye and Ear Hospital, embracing 14,000 cases, I have not encountered a single instance.

One sister died following an operation for removal of abdominal tumor; nature unknown. Another sister is now suffering from an obscure abdominal growth.

Patient was in good health until eight months ago when slight throat irritation developed. About six weeks ago uvula showed enlargement; swelling of soft palate; pain, difficult deglutition; alteration in voice and soreness in cervical muscles.

After operation patient improved in health, developing from a weak, anemic individual to a healthy, robust woman. She has gained 30 pounds.

The child could at will expectorate a round body the size of a pea attached to a pedicle which hung down outside an inch from the mouth. Examination showed this tumor attached to the elongated uvula. The growth and pedicle was excised. Unfortunately the specimen was accidentally destroyed; therefore no microscopic examination was made.

The mother said the child would pull at the skin of her neck, and made a loud, rattling noise when asleep.

Six years previous the patient was operated on for a "swelling in the throat." Nature unknown.

Seven weeks ago patient noticed pain on swallowing and slight cough. Came a few days ago complaining of great pain on swallowing. He said a change in the appearance of the uvula had attracted his attention.

Examination showed the uvula as big as a cherry, reddish-yellow in color, swollen and inflamed. There was no swelling of the glands. Diagnosed carcinoma, which was confirmed by microscopic examination.

Patient complained of difficulty in swallowing and dryness of throat for one year. Patient has been a constant pipe-smoker. Examination showed a strawberry-like mass on the uvula, extending to the soft palate. Submaxillary involvement, but no involvement of cervical glands.

Patient has gained nearly 30 pounds since last operation.

Ten months previous had intense pains; difficulty in swallowing; cough with expectoration.

Examination showed tumor at point of uvula, and entire pharynx red.

Growth in throat for past three months. Slight pain, radiating to the ears. Family history excellent. Difficulty in swallowing. Growth confined to the uvula. Patient in poor condition before operation. Has gained 30 pounds since operation.

First came to the hospital June 23, 1894. He first noticed change in uvula two years ago. The tumor grew very slowly, with no symptoms; about 18 mm. in diameter; it is on the right side of the uvula and has a pedicle. The tumor moves when the patient swallows or coughs; color, white, with reddish spots. Lately pain and difficulty in swallowing; excessive muco-purulent expectoration.

Patient came for consultation in September, 1902. Had had difficulty in swallowing and dryness of throat for about a year. For some months has had to sleep with the head high. Excessive smoker. Constant desire to expectorate mucus.

Examination showed pharynx red and granular; uvula hypertrophied and disappears back of tongue. In strong expiration uvula comes up, and at the extremity can be seen a small tumor. Tumor removed on the 19th of September. Saw patient again on the 26th, and he was in good condition.

Uninterrupted recovery. (No other data.)

Uvula enlarged to size of hazel nut. Came to physician on account of hoarseness. Symptoms disappeared after excision of growth. (No other data.) (Full description of operation in original article.)

Patient complained of pain in throat and some difficulty in swallowing. Operation performed with thermo-cautery.

McCaw, J. F., "Primary Epithelioma of Uvula and Soft Palate," *Tr. Am. Lar., Rhin. & Otol. Soc.*, 1902, p. 173.

Court, Quart. M. J., Sheffield, 1902-3, XI, p. 132.

Friedman, "Elin Fall von Uvula," *Berlin Klin. Woch.*, 1905, XLII, 444.

Smith, Harmon, "Primary Epithelioma of Uvula, Recurrence Took Place After Two Operations," *N. Y. M. J.*, 1905, LXXXI, p. 850.

Bernex, H., "Papilloma of the Uvula," *Marselle Med.*, 1906, XLIII, 767.

Theisen, C. F., "A Case of Primary Carcinoma of the Uvula," *Tr. Am. Lar., Rhin. & Otol. Soc.*, St. Louis, 1907, 289.

Peraire, M., "Tumors of Uvula," *Archiv. Internat. de laryng., etc.*, Par., 1907, XXIII, p. 477.

Peraire, M., "Tumors of the Uvula," *Archiv. Internat. Par.*, 1907, XXIII, p. 478.

Milligan, W., "Epithelioma of the Uvula," *Proc. Roy. Soc. Med.*, 1908, Lar. Sec., p. 87.

Halasz, Monatsch. fur Ohren, Berlin, 1908, XLII, p. 306.

Van Meenan, "Les tumeurs de la luette," *Bull. Soc. de med. de Gand*, 1909, LXVI, p. 119.

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|------|------|---------|-----|----|---|----------|---|---|---|---|-----------------------|
| 1907 | 1892 | Fibroma | yes | 28 | M | 2nd yr. | 1 | | no | 13 years | Lar., 1907, 1 |
| 1907 | 1901 | Pap. | yes | 31 | M | 1902 | 1 | | no | ? | Perrin Archiv 1907, 1 |
| 1908 | ? | Epith. | yes | 62 | M | early | 1 | • | no | ? | Perrin Archiv 478. |
| 1908 | ? | Pap. | yes | 14 | M | early | 1 | | no | ? | Miller Uvula, Lar. 8 |
| 1909 | ? | Epith. | yes | 75 | M | ? | 1 | | no | ? | Halden 1908, 1 |
| 1909 | ? | Pap. | yes | 20 | F | early | 1 | | no | ? | Van Luette, 1909, 1 |
| 1909 | 1897 | Epith. | yes | 56 | M | 2nd mon. | 1 | | No recurrence in uvula or soft palate, but 10 yrs. later came back with large malignant tumor of neck. Died a few months later in cancer hospital | | Van Luette, 1909, 1 |
| 1909 | 1901 | Epith. | yes | 41 | F | early | 1 | 2 | yes | 4 yrs; returned with growth on left tonsil. Exam. proved to be sarcoma. | Dow LXII, 1 |

| 1909 | 1901 | Epith. | yes | 41 | F | early | 1 | 2 | yes | 4 yrs; returned with growth on left tonsil. Exam. proved to be scirrhus. | Dow LXII, |
|------|-----------|-----------|-----|----|---|----------|---|---|-----|--|----------------------|
| 1909 | 3 mo. ago | Epith. | yes | 64 | M | 3rd mon. | 1 | | no | 5 mons. | Dow LXII, |
| 1910 | 1907 | Carcinoma | yes | ? | M | 8th mon. | 1 | 2 | yes | 2 mons. later | Holt Tr. Ar Bedfor |
| 1915 | ? | Epith. | yes | 37 | M | ? | 1 | | no | 1 mon. | Par reported (1915.) |
| 1915 | ? | Pap. | yes | 14 | F | 5th mon. | 1 | | no | 3½ yrs. | Stout Feb., 1 |
| 1915 | ? | Pap. | yes | 32 | M | ? | 1 | | no | 5 mons. | Stout Lar. g publish |
| 1915 | ? | Pap. | yes | 22 | M | ? | 1 | | no | 3 mons. | Stout with surgica |

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| <p>Theisen, C. F., "A Case of Primary Carcinoma of the Uvula," <i>Tr. Am. Lar., Rhin. & Otol. Soc., St. Louis, 1907</i>, 289.</p> <p>Peraire, M., "Tumors of Uvula," <i>Archiv. Internat. de laryng., etc., Par., 1907</i>, XXIII, p. 477.</p> <p>Peraire, M., "Tumors of the Uvula," <i>Archiv. Internat., Par., 1907</i>, XXIII, p. 478.</p> <p>Milligan, W., "Epithelioma of the Uvula," <i>Proc. Roy. Soc. Med., 1908</i>, Lar. Sec., p. 87.</p> <p>Halasz, Monatsch. fur Ohren, Berlin, 1908, XLII, p. 306.</p> <p>Van Meenan, "Les tumeurs de la luette," <i>Bull. Soc. de med. de gand., 1909</i>, LXVI, p. 119.</p> <p>Van Meenan, "Les tumeurs de la luette," <i>Bull. Soc. de med. de gand., 1909</i>, LXVI, p. 122.</p> <p>Downie, W., Glasgow, M. J., 1909, LXII, 211.</p> <p>Downie, W., Glasgow M. J., 1909, LXII, 214.</p> | <p>Growth in throat for past three months. Slight pain, radiating to the ears. Family history excellent. Difficulty in swallowing. Growth confined to the uvula. Patient in poor condition before operation. Has gained 30 pounds since operation.</p> <p>First came to the hospital June 23, 1894. He first noticed change in uvula two years ago. The tumor grew very slowly, with no symptoms; about 18 mm. in diameter; it is on the right side of the uvula and has a pedicle. The tumor moves when the patient swallows or coughs; color, white, with reddish spots. Lately pain and difficulty in swallowing; excessive muco-purulent expectoration.</p> <p>Patient came for consultation in September, 1902. Had had difficulty in swallowing and dryness of throat for about a year. For some months has had to sleep with the head high. Excessive smoker. Constant desire to expectorate mucus. Examination showed pharynx red and granular; uvula hypertrophied and disappears back of tongue. In strong expiration uvula comes up, and at the extremity can be seen a small tumor. Tumor removed on the 19th of September. Saw patient again on the 26th, and he was in good condition.</p> <p>Uninterrupted recovery. (No other data.)</p> <p>Uvula enlarged to size of hazel nut. Came to physician on account of hoarseness. Symptoms disappeared after excision of growth. (No other data.) (Full description of operation in original article.)</p> <p>Patient complained of pain in throat and some difficulty in swallowing. Operation performed with thermo-cautery.</p> <p>This was one case occurring in 1500 patients studied. The patient had no previous trouble. She complained of a disagreeable sensation in the throat and a feeling as of a foreign body. Examination showed a small tumor about the size of a lentil. The microscope showed it to be a papilloma.</p> <p>First seen July, 1897. Throat had been sore for two months. Pain on deglutition; difficulty in deglutition. Snored loudly at night, and frequently awakened with a sense of suffocation. The voice was not affected. The uvula was much enlarged, ulcerated, and the tip was raw; there was a large ulcerated mass near the base. Slight manipulation caused bleeding. No involvement of neighboring glands.</p> <p>Surface of the uvula thick and flattened. Hard to the touch and slight manipulation produced bleeding. Patient also complained of difficulty in swallowing.</p> |
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| Downie, W., Glasgow M. J., 1909, LXII, 214. | Surface of the uvula thick and flattened. Hard to the touch and swallowing difficult in swallowing. |
| Downie, W., Glasgow, M. J., 1909, LXII, p. 216. | Three months previously noticed a sticking sensation in back of throat on swallowing. Five weeks before admission began with pain along both sides of the jaw extending to temporo-maxillary articulation. Uvula thick and flattened; surface ulcerated and granular; hard to the touch, and slight manipulation produced bleeding. |
| Holmes, E. M., Carcinoma of Uvula. Tr. Am. Lar., Rhin. & Otol. Soc., New Bedford, Mass., 1910, pp. 127-179. | Eight months previous began with stiff feeling in uvula and palate; sore but not painful. After a few weeks uvula became red and swollen. He then consulted his family doctor, and was treated locally, and systematically. When I saw him the uvula was gone, leaving granular ulcerations, surrounded by a nodular growth, extending over the soft palate and left faucial pillar. No swelling of the deep glands. Two months after operation a swelling appeared behind the sterno-mastoid. Incision was made and considerable pus evacuated. A week later erysipelas developed. He recovered from the erysipelas, but shortly the entire right side of the neck was involved, with great pain. He can take but little nourishment, and at this time (April, 1910) he is nearing the end. |
| Parsons, J. G., Sioux Falls S. D. (Reported in letter to writer, March 22, 1915.) | No symptoms, except difficult deglutition. Examination showed nodule about 5 m.m. in diameter at root of uvula. Microscopic examination showed typical epithelioma. Excised and base cauterized with galvano cautery. No trouble since. |
| Stout, P. S., Laryngoscope, St. Louis, Feb., 1915, Vol. XXV, p. 88. | About five months previous to consultation patient noticed sensation of foreign body which she could swallow but it would return when she coughed. For this annoyance she consulted a physician. Examination showed an elongated uvula with a mass almost as large as an almond on the end. Lately when she coughed this mass would fly out and strike her front teeth. This mass was excised and microscopic examination showed it to be a papilloma. |
| Stout, P. S., reported before Phil. Lar. Soc., proceedings of which were published in Penn. State Med. Jour. | Patient was unaware of presence of tumor. Discovered in routine examination. No symptoms. |
| Stout, P. S., seen in consultation with Dr. Riddiath at the Medico-Chirurgical Hospital dispensary. | Patient did not know growth was present. It was discovered during course of examination. |

epithelioma. It was excised and the base cauterized with the galvano-cautery. It is one month since the operation and the patient is in good condition.

Out of these nine cases, two were noted to recur. The follow-up history was so incomplete, and many of the cases so recent, that these figures cannot be taken as conclusive.

Taking up papilloma, in 1858, Vidal¹³ reported a primary papilloma of the uvula in a man aged 32.

About 18 months before, the patient noticed a dryness of the throat, causing constant swallowing, also a disagreeable, tickling sensation in the throat.

Examination showed the uvula elongated, with a tumor on the end 1.5 cm. long and 1 cm. wide. The tumor was excised and the symptoms promptly disappeared. There was no recurrence a year after operation.

In 1880, S. D. Risley¹⁴ reported "A Growth Pendant from the Uvula" in a man 32 years of age, which he diagnosed as a papilloma, but gave no data.

In 1886, Kleinschmidt¹⁵ reported "A Papilloma of the Uvula" in a man 60 years of age. The patient was seen in the second year of the growth. Examination showed a tumor on the left side of the uvula. The patient, who was a minister, had had trouble in using his voice for two years previous. The growth was easily excised and the symptoms disappeared, but the author does not state how long the case was followed.

In 1887, W. J. French¹⁶ reported a case of papilloma of the uvula in a man aged 30 years. The patient stated he had had a sore spot in his throat as long as he can remember. This annoyance was further complicated by vomiting whenever he passed directly to the open air after eating. For years he has had a sharp, hacking cough.

Examination showed, hanging from the tip of the uvula, and descending to the right, a body over one inch in length, beginning with a small pedicle and widening to a base circular in form and flat from before backward. The unusual location is my only excuse for reporting it. The author does not state whether the case was followed after operation.

In 1891, Protherat¹⁷ reported a case of papilloma of the uvula in a woman, aged 23. The patient complained of difficulty in swallowing, talking, and coming on recently. Examination showed a tumor of the uvula 2 cm. high, 2 cm. long, and 1 cm. wide at the base; higher on the right side than on the left. The tumor was excised and there was prompt relief of the symptoms. The case was re-

ported two days after operation, so there was not opportunity for ascertaining whether it would recur.

In 1896, Labit¹⁸ reported a case of papilloma of the uvula in a man aged 70. The patient complained of sneezing and frequent expulsion of mucus from the throat; snoring at night, and pain in the throat. Examination showed a pharynx coated with dry, yellow mucus, uvula elongated with a small round tumor at the extremity the size of a lentil. It was pale pink in color, dotted with red. The tumor was excised, with relief of the symptoms, but the author does not state how long the case was followed after operation.

In 1906, H. Bernex¹⁹ reported a case of papilloma of the uvula in a man aged 20. The growth was seen in the second year. Ten months previous he had begun with difficulty in swallowing; pain in throat and cough, without expectoration. The growth was excised, followed by prompt relief. There was no sign of recurrence four months after operation.

In 1907, Peraire²⁰ reported a case of papilloma of the uvula in a man aged 31. The patient came for consultation in September, 1902. He had had difficulty in swallowing and dryness of the throat for about a year. For some months he has had to sleep with his head high. Has a constant desire to expectorate.

Examination showed pharynx red and granular; uvula hypertrophied and disappears back of tongue. In strong expiration the uvula is brought up, and at the extremity can be seen a small tumor. The tumor was removed on the 19th of September. The patient was seen again on the 26th and was in good condition.

This case was not seen afterwards, so it is not known whether recurrence took place or not.

In 1908, Halasz²¹ reported a case of papilloma of the uvula in a male aged 14. The patient complained of hoarseness, for which he consulted the author. Examination disclosed a growth the size of a hazel-nut on the uvula, which was excised, with prompt disappearance of the symptoms. No statement as to recurrence.

In 1909, Van Meenan²² reported a papilloma of the uvula in a female aged 20. He states: "This was one case occurring in 1,500 patients studied. The patient had had no previous trouble. She complained of a disagreeable sensation in the throat and a feeling as of a foreign body. Examination showed a small tumor about the size of a lentil. The microscopic showed it to be a papilloma." The symptoms promptly disappeared after removal. The author does not state whether the case was followed to note recurrence.

In 1915, Dr. P. Samuel Stout²³ reported a case of papilloma of the uvula in a female, aged 14. Five months previous to consultation the patient had noticed a feeling as of a foreign body in her throat which she seemed to swallow, but it would return, when she coughed or hawked. It did not interfere with talking. Examination showed a mass attached to the end of the elongated uvula, which was almost as large as an almond. The uvula was so elongated that in severe coughing the mass would fly out and strike her front teeth. The tumor was excised, and the patient was seen a year later and no symptoms of a recurrence.

I have since then had another case of papilloma of the uvula in a man aged 32. The patient was not aware of its presence, and in the course of a physical examination I discovered it. The tumor was removed last September and there has been no recurrence. Reported at the October, 1915, meeting of the Philadelphia Laryngological Society.

I also saw a case with Dr. Ridpath at the Medico-Chirurgical Hospital, which I am reporting for the first time. This was in a man aged 22, and was discovered accidentally in an examination for something else. I saw this case on December 28, 1915, in the Medico-Chi dispensary with Dr. Ridpath. Examination showed a small papilloma of the uvula. It had given no symptoms and the patient was unaware of its existence. It was removed, and there has been no recurrence, so far as I know.

In the cases of papilloma of the uvula in which data was available, no recurrence is noted, but it is apparent that most of the cases were not followed for long, so that it would not be conclusive to make the statement that there was no recurrence in any of the cases.

In addition to the above there were cases reported without obtainable data as follows: 1893, Wagner, 1 case; Guezzie, 1 case; 1903, Recanatesi, 1 case; 1905, Nakamura, 1 case; 1908, Natier, 1 case; Donelan, 1 case; 1909, Coleman, 1 case; 1910, Holmes, 1 case; Tilley, 1 case; 1911, Connal, 1 case; 1912, Tschiasny, 1 case, making a total of 21 cases of papilloma of the uvula reported during the last fifty years.

Taking up fibroma there have been but two cases reported in this locality. In 1903, D'Aguanno reported a case, but I could not locate the reference, as no data was obtainable.

In 1903, Court²⁴ reported a case in a female aged 4 years. He states: "The child could at will expectorate a round body the size of a pea attached to a pedicle which would hang down outside the mouth for an inch. Examination showed this tumor attached to the elongated uvula. The growth and pedicle was excised. Un-

fortunately, the specimen was accidentally destroyed and therefore no microscopic examination could be made, but it had the appearance of a fibroid.

The mother said the child made a loud, rattling noise when asleep, and would pull at the side of her neck when awake. I did not see the child after the operation, so cannot state as to recurrence."

To summarize: Of the carcinoma there were but three cases reported in detail; two out of these recurred; there were six other cases reported without any data. Of the epithelioma, nine were reported in detail, and two of these recurred. Of the papilloma, there were ten cases reported in detail, with no recurrences. There were eleven other cases reported without any data. Of the fibroma, there were but two cases reported with very incomplete data.

No mention was made in any of the cases of treatment with radium. Raynor treated one case with the x-ray. This was a case of carcinoma, which recurred and at the time Dr. Raynor reported the case, was still under treatment with the x-ray. I could find no subsequent report of the case. This is the only mention made of the use of the x-ray.

Van Meenan and Parsons each reported a case of epithelioma removed with the thermo-cautery.

I wish to thank Dr. Helen J. Cowie (for research in past records) and the Kirschbaum School of Languages (for translation) in getting up this paper.

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BRAIN ABSCESS FROM CHRONIC SUPPURATION IN THE FRONTAL SINUS. CASE REPORT.*

DR. T. PASSMORE BERENS, New York City.

In 1913, before the American Otological Society, I reported a case of "Abscess in the Frontal Lobe of the Brain of Otitic Origin" (published in the *Annals of Otology, Rhinology and Laryngology*, June 1913). At that time a somewhat close study of the literature showed but forty-nine other cases of abscess of the frontal lobe. Since then the following cases have been published:

LUBBERS, KARL. "Hirnabszess, Osteomyelitis des Stirnbeines, Stirnhohlenempyem." *Archiv. für Ohrenheilkunde*, Vol. XC, 1912-13, page 172. W. W., female, 32 years old. Chronic frontal sinusitis. Fistula in right eye-brow, leading into frontal sinus. Osteomyelitis of frontal bone. Abscess in frontal lobe of brain. Cure.

HIRSCHBERG, OTTO. "Beitrag zur Lehre der Hirnabszesse." *Deutsches Archiv für klinische Medizin*, 1912-1913, Vol. CIX, p. 314. J. K., male, 34 years old. Broken-down bronchial glands. Fistula from broken-down glands into esophagus. Slight tubercular lesions in lungs. Purulent meningitis. Abscess in right frontal lobe which perforated on to the surface of the brain. Several smaller abscesses in other parts of the brain. This was a case of metastasis in the brain from abscess in the bronchial glands. Symptoms were those of meningitis.

ZEMANN, W. "Beitrag zur Kenntnis der Endokraniellen Komplikationen nach chronischer Nebenhohlenerkrankung." *Zeitschrift für Laryngologie, Rhinologie und ihre Grenzgebiete*, 1913-14, Vol. VI, p. 545. G. B., male, 37 years old. Chronic frontal sinusitis. Fistula through left eye-brow. Killian operation was done on both sides. Necrosis of posterior wall of right frontal sinus. Facial paralysis on left. Paralysis of left hypoglossal nerve. Left hemiplegia. Clonic spasms of upper extremities. Sopor. Cheyne-Stokes breathing. Exitus. *Post-mortem*: Leptomeningitis. Frontal lobe adherent to posterior surface of frontal sinus. Cortical abscess in frontal lobe. From here there is a fistula leading to two deeper abscesses in frontal lobe.

ELSCHNIG, A. "Der otogene Hirnabszess und seine Operation." *Prager Medizinische Wochenschrift*, 1914, Vol. XXXIX, p. 37.

Read before the American Laryngological Association, Washington, D. C., May 11, 1916.

Case 1. Boy, 12 years old. Phlegmon of left upper eyelid. Incision. Apathy. Paresis of right side of body. Roof of orbit removed. Incision of frontal lobe abscess. Cure. *Case 2.* Male, 45 years old. Chronic frontal sinusitis. Killian operation. Aphasia. Orbit contains granulations. Removed orbital roof and incised abscess in frontal lobe. Exitus. Purulent meningitis.

PIFFL, OTTO. "Zur Kasuistik der rhinogenen Stirnabszesse." *Prager Medizinische Wochenschrift*, 1914, Vol. XXXIX, p. 39.



Fig. 1.

Male, 36 years old. Chronic frontal sinusitis left. Exophthalmos. Intranasal treatment. Cerebro-spinal fluid cloudy. Diplopia. Vomiting. Ptosis. Killian operation. Optic neuritis. Five weeks later, pain and rise of temperature. Vomiting. Orbital roof removed. Frontal lobe incised. No pus. Exitus. *Post-mortem*: Left frontal lobe adherent to orbital roof. Abscess in frontal lobe.

CASAMAJOR, L. "Brain with Double Frontal Abscesses." *Medical Record*, 1915, Vol. LXXXVII, p. 412. Male, 50 years old. Frontal

headache. Tongue coated. Breath offensive. Temperature normal. Pulse 60. On the fifth day, involuntary defecation. Temperature rose to 101° F. Pupils contracted and sluggish. Nose and ears normal. On the seventh day, chill, temperature 106° F. Coma and death. *Post-mortem*: Abscess in both frontal lobes. Pus contained bacillus pyocyaneus. Meninges normal. The brain infection was probably hematogenous.

It is now my pleasure to report the following case:

January 8, 1913: W., male, age 30, consulted me on account of a severe pain in and over the right eye, which had persisted for

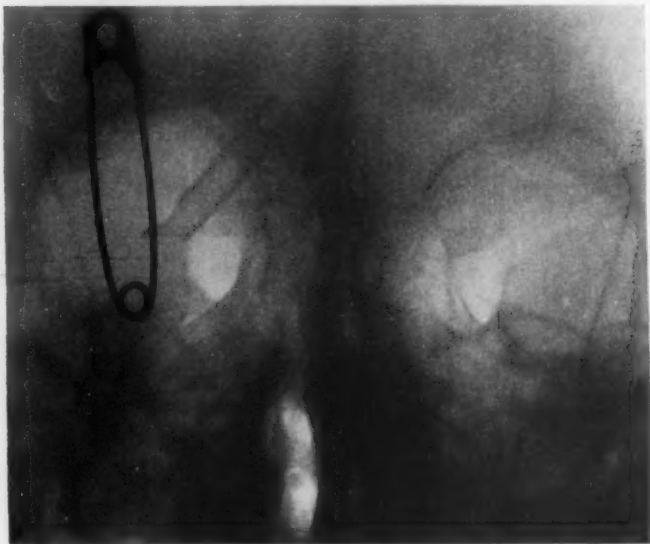


Fig. 2.

several weeks. He complained also of a profuse discharge of pus from the right nostril. This purulent discharge had persisted for many years. Excepting these two conditions, he had always been well.

Family history: Mother had had a successful operation for one-sided pansinusitis ten years before. Father had undergone an operation for a surface epithelioma in the temporal region many years ago.

Examination of the nose: Superior and middle meati filled with myxomatous material. Septum deflected to the left.

Transillumination showed the right antrum, ethmoidal and frontal sinuses dark. At this sitting, several large polypi were removed without affording relief from the pain.

Pathological Report: Myxoma. Wasserman negative.

A few days later, an x-ray examination by Dr. F. M. Law, of the Manhattan Eye, Ear and Throat Hospital, showed pansinusitis of the right side (Plates 1 and 2).

On January 16, under gas and ether anesthesia a radical external frontal, ethmoidal and sphenoidal operation was performed, and the antrum of Highmore opened through the naso-antral wall be-



Fig. 3.

neath the inferior turbinal. The frontal sinus was filled with pus and myxomatous material. There was a small oval sequestrum one-fourth inch long by one-eighth inch broad of the internal table, beneath which the dura was reddened but apparently not otherwise diseased. The antrum contained only pus. The external wound was stitched. The patient made a rather slow convalescence.

On May 9 the nose presented a fairly normal appearance and the patient's general condition was good. I saw him again in December, 1913, when he complained of much pus coming from the nose. The naso-antral wound had healed, and pus was exuding from the osteum of the antrum. The old wound was reopened and washed out.

The patient made a complete recovery after a few weeks and was well until July 24 of the following year (1914) when he had a return of the discharge of pus from the antrum. At this time I opened the antrum freely through the canine fossa. It contained much thick, creamy pus, but no distinct growth of granulation tissue.

On December 30, 1915, there was an exacerbation of the discharge.

On January 3, 1916, the patient complained of considerable frontal headache. There was slight puffiness of the cicatrix over the right frontal sinus. I irrigated the frontal region, which was discharging much pus.

Two days later (January 5) the frontal headache was decidedly worse, and there was a large swelling of the cicatrix in the right frontal region. Pressure applied to the scar caused a considerable discharge of pus into the nostril.

Much against his will, for he "did not feel ill" and he was very busy, the patient was sent to the Manhattan Eye, Ear and Throat Hospital at once.

Under gas-ether anesthesia, I incised through the old frontal wound and entered a small pyogenic sac about the size of a cherry. The incision released pus, under slight pressure, and caused considerable bleeding. While the bleeding was being controlled by adrenalin packing, I took down the lower anterior third of the naso-antral wall and opened through the track of the old wound above the first molar. There was much pus but no granulomata. The wound in the frontal sinus was then examined. About four drams of pus oozed from a small mass of granulations in the roof of the sinus at the location of the sequestrum. The granulations were hiding a perforation through which a probe dropped inward and upward toward the vertex for a distance of two and one-eighth inches from the roof of the sinus. I very gently enlarged this opening by inserting a closed bayonet forceps and allowing the blades to open slowly. Because of the firm adhesions between the bone, brain and the soft parts, it was considered unwise to disturb the existing conditions, and therefore the only further procedure resorted to was the insertion of a horse-hair drain into the stem of the abscess. The nose was closed off by rubber tissue packing and a wet gauze dressing was applied.

During the afternoon and night, the external dressings were soaked with pus. These dressings consisted of as much loose gauze as is usually used in a large mastoid dressing.

From the day following the operation more strands of horse-hair were added daily for a week, when the stem of the abscess had be-

come as large as a lead-pencil. A soft rubber drainage tube was then inserted, and for a week longer, i. e., for two weeks, it was necessary to change the dressings every six hours. The discharge gradually lessened and practically ceased at the end of five weeks, but the wound was not allowed to heal until April 18. The flow of pus affected the conjunctiva, but argyrol controlled this condition successfully.

General symptoms after the operation: Heart action irregular; much frontal headache; restlessness and irritability; slight photophobia; very slight redness of the optic nerve; pupils contracted (Dr. E. S. Thomson). No other nervous manifestations. Temperature ranged from 100 to 101 degrees for ten days, gradually becoming normal.

Culture from brain: Streptococcus haemolyticus in pure culture (Dr. J. G. Dwyer).

Blood culture day after operation: Streptococcus haemolyticus in small numbers.

Blood culture a week later showed no growth.

On February 2, a severe infection (streptococcus) of the left side of the nose and accessory sinuses. This caused persistent and increasing pain in the left eye. Because of this, on February 8, I was compelled to do a middle turbinectomy, which, together with the usual after-treatment, afforded the desired relief from the pain.

The patient had frequent treatment by autogenous vaccine.

Remarks: For the past two weeks, the right nostril has been free from pus, excepting for small crusts that persistently form on the posterior wall of the pharynx. There is still considerable discharge of pus at times from the left nostril, and I propose at an early date, to correct the deflection of the septum and possibly to operate on the ethmoidal cells.

My study of the cases convinces me that the patient carried a large collection of pus in the frontal lobe for many weeks, if not for months; and that this abscess was the source of the pus in the right side of his nose. The occupation of the patient requires great alertness and very active concentration. He continued at his work until January 3. For the past six weeks he has carried on his work daily with perfect satisfaction to himself and to his employers.

35 Park Avenue.

A SIMPLE METHOD OF FIXATION OF INTUBATION TUBES.*

DR. SAMUEL IGLAUER, Cincinnati.

Prolonged and continuous intubation is occasionally necessary for the relief and treatment of chronic stenosis of the larynx. Excellent results may be anticipated from this method of treatment but the chief objection lies in the danger of auto-extubation and asphyxia in the absence of some trained person capable of immediately reintroducing the tube.

In order to prevent this accident, Rogers¹⁻² devised a method of fixation of intubation tubes in subjects previously tracheotomized. After intubation the tube was held in place either by screwing a plug through the tracheal fistula into a screw-hole previously made in the anterior wall of the intubation tube, or by fastening two clamps into a groove about the middle of the intubation tube. The neck of the Rogers tube was especially built up to effect a dilatation in the stenotic area.

Polverini and Isonni³⁻⁴ have devised a very ingenious method of tube fixation, which dispenses with the necessity for a tracheotomy. A curved needle bearing a long silk thread is introduced through the middle of the thyro-hyoid space until the needle and thread appear in the vestibule of the larynx, behind the epiglottis. The needle and thread are then grasped and drawn out of the mouth while the other end of the thread remains on the outer surface of the neck. The oral end of the thread is then tied (with a long end for subsequent extraction) into the eyelet in the head of the intubation tube, which is introduced in the usual manner, while an assistant takes up the slack in the thread protruding from the neck. Spontaneous extubation is prevented by fastening this thread to the neck with a bandage.

The method which I have devised is a modification of Rogers' technic, and is especially adapted for cases of laryngeal stenosis, which, in the course of treatment, have required a tracheotomy. It may also be used in the intubated patient by cutting down through a few tracheal rings onto the intubation tube.

The technic is as follows: A shallow groove is filed around an ordinary hard rubber intubation tube, just below the swell of the tube. Into this groove a silk thread about ten inches long is firmly tied, with the knot on the anterior face of the tube. (Figure 1.) The ends of the thread are tied together and the thread and groove are saturated with melted paraffin, to remove all sharp edges. Intubation is then performed in the usual manner. After intuba-

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tion the silk thread is picked up with a slender forceps (or a crochet needle) and drawn out through the tracheal fistula. The thread, which may well be termed an anchor-thread, is drawn fairly taut and fastened to the skin with adhesive plaster, rendering spontaneous extubation impossible.

When it becomes necessary to remove the tube the anchor thread is freed and the tube withdrawn in the usual manner. A somewhat more complicated procedure is to lengthen the anchor thread by tying on a second thread which will protrude from the neck when the intubation tube is withdrawn. An assistant can pull on this protruding thread while the patient is being reintubated and again draw the anchor thread into place.



Fig. 1. The author's method of anchoring an intubation tube. A silk thread is tied into a groove in the tube. After intubation the thread is drawn through the tracheotomy fistula, and fastened to the skin with adhesive plaster.

In order to dilate a stenosed larynx, larger and larger tubes must be successively employed until oversize tubes have been worn for prolonged periods. It is usually necessary to shorten oversize tubes. The built-up tubes of Rogers are admirable for dilatation.

The advantages of the anchor thread method lie in the simplicity of the attachment and the ease with which ordinary intubation tubes may be prepared for fixation. No injury to the trachea can occur, since the anchor-thread and groove exert no pressure on that structure. I have employed this method in three cases. The first was reported in full in the *Lancet-Clinic*, October 11, 1913.⁵ This was a case of primary laryngeal diphtheria, upon which at intervals the operations of intubation, tracheotomy, laryngostomy and prolonged intubation, with an anchor-thread were successively carried out. The child wore the anchored tube for about nine months, and finally recovered with a normal laryngeal lumen and a fair voice.

Case 2. E. D., male, aged 3 years; came under my care August 25, 1912. He was suffering from severe dyspnea and aphonia,

which had been increasing for two years. There were numerous papillomata on the left cord and anterior commissure.

On August 27, 1912, under ether, followed by chloroform, the papillomata were removed. Six weeks later breathing was much improved, but the voice was still hoarse. December 23, 1912, there was some recurrence of papillomata which were removed under suspension laryngoscopy. X-ray treatment was instituted by Dr. Lange at intervals, with six exposures in all. Suspension laryngoscopy and removal of papillomata again became necessary on April 23, 1913. The x-ray treatment was continued, and the child did very well for three months thereafter, and the voice returned for six weeks, and then gradually disappeared with slowly increasing dyspnoea. On October 7, 1913, while attempting removal of recurring papillomata, dyspnea became so intense that immediate tracheotomy became necessary. In the following six months the child gained 12 pounds in weight, but the papillomata persisted, and even appeared in the tracheotomy opening. A roentgenogram showed the lumen of the larynx entirely obliterated by the new growths.

Fifty milligrams of radium, kindly loaned me by Dr. Ransohoff, was then applied to the interior of the larynx on March 4, 1914, for four hours; on March 21, for four hours and on April 13, for five hours. Examination on April 30, 1914, showed papillomata still present on the left side of the epiglottis, on the false cords and the anterior commissure. When the glottis opened, the interior of larynx seems to be patent. The tracheotomy fistula was widened. (Radium effect.) June 8, 1914, 50 milligrams of radium were applied in the larynx for eight hours. October 4, 1914, direct examination showed the epiglottis normal, the cords could not be distinguished. There were no papillomata visible. It was impossible to introduce a small intubation tube from above or to pass probes from below. The aditus laryngis and ary-folds felt unusually firm to the touch. On October 10, 1914, under ether insufflation anesthesia, probing from below, as well as intubation both failed. A median laryngofissure was made. The larynx lumen was somewhat narrowed, the vocal cords were undistinguishable. There were no papillomata present, and a few granulations were found above the convex bend of tracheotomy tube.

The laryngostomy was kept open for about six weeks when intubation with three-year size intubation tube was begun. The intubation tubes were anchored as described above. Intubation was continued, and the child moved to Louisville on November 28, 1914,

where he came under the care of Dr. I. Lederman, who informs me that with the exception of a few days, the child has worn the tube for about fifteen months. The tube he is now wearing is a twelve-year size cut off to a six-year length.

Case 3, in brief, is as follows: T. W., aged 2 years, was seen March 4, 1914, suffering with inspiratory dyspnea. She suffered from frequent attacks of asphyxia. Examination revealed multiple papillomata of medium size above the cords and about the anterior commissure. A few were removed and a cross-fire of radium was applied externally for four hours. On September 13, 1914, the patient developed tonsillar and laryngeal diphtheria with marked stenosis, which was relieved by intubation. The intubation tube was removed at the end of a week. No dyspnea followed the removal of the tube. On November 9, 1914, papillomata again obstructing larynx, the child was intubated for a few days, and direct fulguration was applied by Dr. E. O. Smith. There was no improvement during the following months. On December 10, 1914, after the child had had a severe choking spell, during the night, intubation with an anchor thread was performed and under novocain anesthesia, a short incision was then made into the trachea, following which the anchor-string was pulled out, and fastened to the neck. The anchored intubation tube was worn home by the child and was changed at intervals of seven to fourteen days during a period of ten weeks, i. e., until March 1, 1915. On that day, while demonstrating the case before a clinic of the Ohio Medical Society, the child became asphyxiated before a tube could be reintroduced. By rapidly enlarging the tracheal fistula and with the aid of artificial respiration the breathing was restored. Since that time the child has worn a tracheal canula. In this case intubation was employed with the object of compressing the papillomata and putting the larynx at rest, but with the tracheal canula in place the papillomata seem to show some tendency to disappear so that the intubation tube has not been reintroduced.

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22 West Seventh Street.

ACIDOSIS: ITS IMPORTANCE IN NOSE AND THROAT SURGERY IN CHILDREN.*

DR. W. H. JOHNSTON, Muscatine, Iowa.

Acidosis is a term which, until a comparatively short time ago, was supposed to indicate the presence in the urine of acetone bodies and this usually associated with diabetes. Normally, the body is continually producing acids and it is also excreting and neutralizing them. It is not the mere presence of acetone bodies that determines acidosis. In children they are not a frequent cause. A slight acidosis is the rule in health, but the quantitative difference between the presence of acetone bodies and their production in amounts to threaten life is an enormous one.

We say that acidosis exists when so much bicarbonate is lost from the blood, that the administration of a certain amount of bicarbonate fails to diminish the urinary acidity. Meat and proteins tend to increase the tendency to acidosis. In a vegetable diet the reverse is true. Normally, the blood has the power of neutralization of acid and a slightly alkaline reaction is maintained. Minute changes in the reaction of the various body fluids may so disturb the functions as to render life impossible. For instance, a change in the blood reaction from normal to neutral, or a change from the reaction of ordinary tap water to that of distilled water would cause death.

The constituents of the blood which regulate the reaction are sodium bicarbonate, the acid and alkaline phosphates and protein. It is estimated that in the course of twenty-four hours, the amount of acid produced and given off by an adult would be equivalent to several hundred cubic centimeters of concentrated hydrochloric acid. These acids are carried from the tissue by the blood to the lungs from the points of highest concentration to the lowest. Henderson calls the carbonates of the blood the first line of defense. And thus dyspnea or hyperpnea aids in ridding the body of carbonic acid and helps to maintain a normal limit. The kidneys remove acid phosphates by their specialized activity and leave behind part of the base

*Read before the Northwestern Ophthalmological, Laryngological, Rhinological and Otological Society, at Omaha, Neb., June 8, 1916.

with which the acid was combined. Proteins have the property of uniting with acids without undergoing much change in reaction. Ammonia production also assists in maintaining this defense against the acids produced.

While very little scientific work has been done on the condition of acidosis as a complication or sequel of tonsil and adenoid operations, there seems to be a more or less definite relation between the two. Whether or not it is simply the anesthetic, the shock or some change produced by the removal of this tissue, is the problem that remains to be worked out.

Sajous reports 383 cases in which an anesthetic was given for various surgical operations. In forty-six cases symptoms of acid intoxication were present. In some of these, grave symptoms occurred; in others the condition was only found by a routine urine examination. In seventeen cases symptoms were present on entrance, in twelve they developed within twenty-four to forty-eight hours later. In seventeen cases which developed after admission there was an assignable cause. Death resulted in six cases.

Beven and Favill collected, in 1905, twenty-nine scattered cases which were very similar in regard to acid intoxication and late poisoning effects from anesthetics. One typical case is reported in detail. A large amount of anesthetic was required, but the patient was soon conscious, with a pulse of 102° and temperature of 101°. About forty-eight hours later the symptoms of poisoning were quite marked. The child talked incoherently and exhibited evidences of great fright. The pulse rate increased and the delirium continued. Later on, periods of marked excitement occurred. Death took place five days after the operation with rising temperature, irregular, rapid pulse and Cheyne-Stokes respiration. During the last two days there was a sweetish acetone odor to the breath. Symptoms which are common in most cases, were not mentioned here: persistent vomiting without any apparent cause, and air hunger, dyspnea and cyanosis.

In Boston there was reported a case of death from acidosis in a child operated upon for tonsils and adenoids. Another surgeon operated on his own child for adenoids and death resulted from acidosis in about forty-eight hours. In Detroit, recently, a patient died of acidosis following a tonsil and adenoid operation. In Chicago, a number of cases have been reported,

none of them being fatal, however. Dr. Dean, of Iowa University, has had two marked cases of acidosis following operation. One case developed in two days following the operation. There was continuous vomiting without fever and the child did not appear to be ill. There was a marked acetonuria, which cleared up quickly by the use of large doses of sodium bicarbonate. His second case was one where the symptoms began the second day following the operation and the child became comatose. The urine was markedly acid. Large doses of sodium bicarbonate relieved the comatose condition, but the acetonuria persisted. This child developed scarlet fever in three days. The operation was evidently performed during the period of incubation. There is a question as to what was responsible for the acidosis which persisted, and the child died about fourteen days following the operation.

Dr. Dean is now observing a series of cases in which no attempt is being made before operation to prevent acidosis. Last Saturday he operated on a child thirteen years old for tonsils and adenoids. The urine was perfectly normal before the operation. On the second day there was marked acidosis with violent vomiting. The condition was promptly relieved by an injection of five per cent sodium bicarbonate per rectum.

Recently in my own practice I have had two cases in which there were quite marked symptoms of acidosis, following operation for removal of tonsils and adenoids.

Case 1. Male, age three and one-half years, had adenoids and very large tonsils, which touched in the median line. Ether anesthesia was used, the same being vaporized and warmed. The time required from the beginning of the anesthetic to the completion of the operation was about thirty minutes. Thirty-six hours following, the temperature was 101° and the pulse 110, and at this time the child began vomiting. Attempts to take food or water would bring on an attack and the child constantly complained of being very thirsty. There was acetonuria present. The administration of two ounces of 5 per cent sodium bicarbonate solution per rectum repeated three times at two hour intervals cleared up the symptoms promptly.

Case 2. Female, age five years, tonsils and adenoids removed under ether anesthesia as in Case 1. The entire time required was thirty minutes. Twenty-four hours after operation vomiting began. Temperature and pulse were 99.5 and 100 respectively. Vom-

iting in this case began on any attempt to swallow. No acids were found in the urine. The symptoms in this case cleared after the administration of one injection of two ounces of 5 per cent sodium bicarbonate per rectum.

There are many opinions regarding the cause of these various manifestations, and doubt is expressed by some concerning the existence of such sequels, but there have been reported in this country during the last year more deaths from acidosis following this operation than from any other. Idiosyncrasy, gastrointestinal disturbances, disturbed metabolism and nervous influence are some of the explanations offered. No matter what the cause may be it is certain that we do have an acidosis in a proportion of cases and even though they have not been recognized nor received treatment, they do not necessarily **prove** fatal.

There is such a wide range of acid production and retention in the body that it is very difficult to say when acidosis is present. How are we to detect any tendency toward this condition?

1. The urine is examined and we find abnormal acids, which shows that there is a disturbance of ordinary metabolism. Fatal acidosis may occur, however, when no abnormal acids are found in the urine.

2. We must look for evidence of unusual activity in the body's defenses by determining the amount of ammonia and its relation to the total nitrogen output. In the acidosis due to the inorganic substances as when the excretion of acid phosphates is interfered with, there is not an increase in the ammonia. A high ammonia coefficient should always make us suspicious of acidosis and further tests should be made.

3. By testing the alveolar carbon dioxide tension, we find it diminished in acidosis, because there is a decrease in the carbonate in the blood, part of it being used to neutralize the excess from the tissue. There is a deviation then from the normal reaction of the blood and an accumulation of carbon dioxide. This gives rise to an important symptom of acidosis, dyspnea and air hunger.

4. By testing the blood plasma for its bicarbonate content. Roughly this can be done by estimating the amount of bicarbonate which we must give in order to bring about a change in the reaction of the urine. This is spoken of as the tolerance for alkalis.

5. Testing the reaction of the blood by the use of some indicator.

In order to carry out many of these tests a well equipped laboratory is necessary, but we should make a thorough physical examination in all cases before administration of an anesthetic. The urine should be carefully examined and some one test made on the blood before and after operation. Meat, proteins, etc., increase the tendency to acidosis as does starvation. To this latter fact may be partly due, the tendency for this class of cases to be more susceptible to acidosis. Because they are usually not given any food for twelve hours before the operation and on account of the difficulty in swallowing, it is difficult to get them to take much nourishment for some time following. Meat should be restricted and a vegetable diet given for several days before operating. Do not starve the patient. Fifteen grains of bicarbonate of soda three times daily for two or three days should be prescribed, and if any tendency to acidosis is found by the tests used, we should give per rectum a solution containing forty-five grains of bicarbonate of soda one-half hour before operation. We should prevent, if possible, any of the conditions which tend to produce acidity of the blood, excessive muscular activity, excessive emotional excitement, surgical shock and the use of an excessive amount of anesthetics. Morphine before the anesthetic delays and prevents the acidosis but when given after the anesthetic has been started it seems to interfere with the normal mechanism by which the acidity is neutralized.

The symptoms of acidosis which develop after operation are dyspnea, or air hunger, nausea and vomiting without apparent cause or brought on by the slightest attempt to swallow, though the patient may be very thirsty. This vomiting is usually cyclic or recurrent. Headache occurs in most cases. Drowsiness and delirium. There may be present slight fever but often the temperature is subnormal. If the acidosis is due to the acetone group, there will be the characteristic odor to the breath, and the presence of these acids in the urine. If, however, the acidosis is due to the inorganic salts, this latter will not be true and it does seem that many of the acidoses associated with tonsil and adenoid surgery are inorganic in type.

The treatment, regardless of the type would be to empty the intestine by a warm enema of magnesium sulphate, glycerin and

water. This to be followed by colonic irrigation with 5 per cent solution of bicarbonate of sodium, which may be repeated several times or may also be given intravenously or subcutaneously, but if given by the latter method we must be sure that none of the bicarbonate has been converted into carbonate as sloughing of the tissues may result.

Much remains to be learned as to the connection between acidosis and tonsil and adenoid operations; one German article has been written on the subject but I was unable to get a reprint. We do know that some relation does exist but the anesthetic certainly plays an important part in producing the condition.

I believe that we can all recall cases that had symptoms due to acidosis. While not always fatal, some unfortunate results could have been avoided had we made a more careful physical and laboratory examination of these patients.

The tonsil and adenoid operation is to-day regarded by many, especially general surgeons, as a very minor operation and is performed without any preliminary examination or preparation whatever. It is the purpose of this paper to emphasize the importance of more closely observing our nose and throat cases before operation and carrying out some of the more simple tests for acidosis. If we would all make and record these observations and the final results, we would have some very interesting and valuable statistics a few years hence.

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INFECTIONS OF THE EARS, NOSE AND THROAT AS PRIMARY FOCI FOR SECONDARY INFECTIONS.*

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Every patient is entitled to the benefit of co-operative diagnosis and treatment. In no field of medicine and surgery is there a greater opportunity for co-operation than in the particular field covered by the title of this symposium. It hits every department of medicine and surgery with almost equal force. The subject is not a new one. In 1789, Eyerlen, of Christiana, in his "*Materia Rheumatica Ad Tonsilitas*," considered the relation of tonsillitis to rheumatism as clinically evident. For over a century following this the literature is barren of the subject. The review of the literature up to 1909 reveals that no scientific relation between focal infections and secondary lesions had been established. It was clinically evident that certain forms of infectious diseases follow closely on the tonsillar affection and that micrococci are present in the tonsillar infection and in the secondary disease. Up to 1909, clinical evidence of the relation between primary foci and secondary infections was presented so conclusively by many clinical observers that it hardly needed scientific proof to make it a fact beyond dispute. During the ten years previous to 1909, one hundred and eighteen observers had contributed to the literature and presented clinical evidence of the relation of tonsillar infection to other diseases. During this period, in spite of clinical evidence that the tonsils were the portals of entry for many secondary infections, by far the greater number in the medical profession paid little or no attention to this subject. In fact, the great majority openly expressed disbelief and adhered tenaciously to the old theory of faulty metabolism and the hazy bio-chemical reactions with which faulty metabolism appears to be associated. Comparatively few were practicing complete removal of the tonsils at this time. There were, however, a sufficient number of zealous workers, who believed that the dawn of a new era in scientific medicine was near at hand, to carry forward the work so well started. From time to time new workers have appeared on the field, and to-day this subject occupies a prominent place in clinical and laboratory investigations. From 1910 up to the present time, the literature has been redundant with the subject,

*Read before the Brooklyn Society of Internal Medicine, November 26, 1915.

but this period has been occupied in presenting scientific proof to add to the voluminous clinical evidence. In reviewing the literature of this period, the writer found that forty-eight different authors had presented scientific data to prove that many diseases of infectious type are secondary to primary focal infections. Many of these have contributed a number of times and all of them have been working toward the same end. Such a review compels the conclusion that such a relation has been scientifically proven and that its acceptance is no longer open to reasonable doubt. In 1910, the real work was started which has progressed with rapid strides, until now we have very definite scientific proof of the etiologic relation of focal infections in the upper respiratory tract and ear to a considerable number of diseases. During this period equal progress has been made in proving that like foci are present in the teeth and genito-urinary tract.

The consensus of opinion is that the tonsils are the most frequent focus; that the nasal sinuses and teeth are still struggling for second place, and that the ear is third in importance as a focus. We include in the tonsils the chain of lymphoid tissue known as "Waldeyer's Ring." The lymphoid tissue on the posterior pharyngeal wall, especially the lateral folds, is also an important focus.

The bacteria responsible for the focus and for the metastatic infection belong to the streptococci group. The staphylococci occasionally play an active part. The pneumococci have sometimes been credited with being the infecting organism. The ameba has been found in the tonsils as well as in the teeth. How important a part the ameba play in the infectious process primarily or secondarily has not been satisfactorily settled. The streptococci are always present in those cases in which the ameba have been found wherever secondary infection is present. The streptococci have been isolated repeatedly from the secondary lesions, but the ameba have not been so isolated. The streptococci isolated from the secondary infections have been more virulent than those isolated from the primary focus in the same case. The strains of streptococci are the viridans, the hemolyticus, and a strain which is neither the viridans or the hemolyticus. This strain is more virulent than the hemolyticus. The transmutation of one strain of streptococcus to another strain in artificial culture media, is undoubtedly duplicated to even a greater degree in the tissues of the body. For this reason the bacterium isolated from the secondary focus is more potent in a vaccine than the bacterium isolated from the primary focus. The infecting organism has been given various

names by different investigators. Rosenow has isolated three types of streptococci from rheumatism. The first produces a green on blood agar and forms very long chains. The second produces a narrow zone of hemolysis on blood agar from the beginning or after several generations, and forms short chains. The third produces a grayish-brown colony without affecting perceptibly the blood in the media and appears as a diplococcus in short chains and as single cocci.

"There are other cultural and reaction features that are distinctive, but striking as they are, they are not so distinctive as the pathogenic properties. The results following injection into animals are quite different, depending on whether we inject the viridans or the hemolyticus or a mixture of these two strains. It is common to produce by intravenous injection into rabbits, multiple non-suppurative arthritis, endocarditis, myocarditis and pericarditis in the same animal. By modifying these strains by varying the culture methods, their affinity for joints, endocardium and pericardium becomes less and their affinity for muscle, myocardium and kidney much greater."

If one studies the reports of those who have isolated specific organisms the conclusion is that they have described the same organism, but have called it by different names. That it is a Streptococcus they all agree. Streptococci have been isolated from the intestinal contents. The streptococci find their way through the lymph and blood streams to the selected site of secondary involvement. When they arrive in their different environment they change their characteristics and become more virulent, producing lesions entirely foreign to those produced at the site of the original focus. That all of the secondary lesions can be produced by the passage of the streptococci into the circulation is proven by the intravenous injection into animals. This includes gastric and intestinal ulcer, arthritis and endocarditis. That such lesions of the gastro-intestinal tract can also be produced by the swallowing of the streptococci seems very probable. We swallow other bacteria, such as typhoid, and have produced the specific disease of the organism. Like the typhoid bacillus the streptococcus has a predilection for lymphoid tissue and this, it would seem, adds to the likelihood of the streptococcus, when swallowed, producing its lesions.

The diseases attributed to primary foci in the upper respiratory tract and the ears, as well as teeth, are: acute rheumatic fever, so-called, often associated with chorea; endocarditis, acute and chronic; arthritis, acute and chronic; nephritis, acute and chronic; bron-

chiectasis; gastro-intestinal disturbances, such as ulcer and stasis; acute and chronic appendicitis; cholecystitis and cholangitis; myositis; Tenosynovitis; neuritis, acute and chronic; septic iritis and iridochoroiditis and acute thyroiditis, followed by chronically enlarged thyroid. We have sufficient evidence to justify the belief that these diseases are always of an infectious character and that they are always secondary to a primary focus and never primary. There must always be a portal of entry.

Adami defines health as "metabolic equilibrium." Disease then is disturbed metabolism. Hence to say that arthritis (or other infectious processes) is due to disturbed metabolism, is to say it is due to disease. When we speak of disturbed or faulty metabolism as a cause of disease we are stating that disease is caused by disease and such a statement means that one disease produces another. Faulty metabolism is a result of infectious disease and not a cause. Disturbed metabolism is not an initial lesion.

The practical application of the knowledge gained in the last few years should engage the attention of every practitioner of medicine no matter what particular field of work he may be engaged in.

When a patient presents himself with any of the foregoing conditions he should be subjected to a most painstaking examination. The therapy follows the diagnosis. As a concrete example let us take a patient with chronic arthritis. We want to know what type of chronic arthritis we have. It is doubtful if such a diagnosis can be made if the entire body is covered and only the joint presented for examination, and no history is presented. The x-ray picture must be taken. It will show us the changes in the joint, but not sufficiently well to make a diagnosis. Such a patient should have also, in addition to a complete history, a painstaking examination of the teeth, nose, throat, ears, genito-urinary tract and pelvis as well. A skiagraph should be taken of the teeth, the nasal sinuses and mastoid, if the middle ear is infected. The nose and nasal sinuses should be examined and cultured. The teeth should receive the same attention. The details of the examination of the ears, nose and nasal sinuses and the tonsils are important. It is, for instance, easy to make a positive diagnosis of infection of the nasal sinuses if we see pus. To exclude nasal sinus infection is exceedingly difficult. It requires careful and conscientious work. A tonsil which presents the gross appearance of infection is readily diagnosed. To exclude infection from a tonsil by inspection is impossible. If pressure on the tonsil fails to produce anything, we

may still have an infected tonsil. I have frequently removed tonsils that presented a healthy appearance and found that they contained multiple abscesses. Cultures from the crypts always show bacteria, but not always the infecting organism. Aspirating the tonsil with a needle often affords a satisfactory method of obtaining a pure culture. In the presence of a secondary infection even a suspicious tonsil should be removed. This means an enucleation, which is the only operation that ever should be performed on any tonsil. The so-called innocent tonsil is usually not innocent. Frequently if the principal focus is eliminated it will help to clear up other foci. When we have found a primary focus in the presence of any infectious disease, it should be eliminated at once as the first step in the treatment. The vaccine therapy should not be employed until the primary focus has been removed, otherwise our results will be negative. In the case of the tonsils, the vaccines may be prepared from the freshly removed tonsil. We must always isolate the streptococcus. Other bacteria may be concomitant factors, but a streptococcus we must have. The viridans is usually found on the surface of the tonsil or near the proximal end of the crypts. The hemolyticus on the other hand is more likely to be found deeper in the tonsil. Whenever possible the Streptococci should be isolated from the secondary focus and a vaccine made from them. The other measures of treatment are to be instituted as soon as the vaccine has been prepared. It has been found that streptococcus serum has no apparent effect on the progress of the disease, and is dangerous to use because of anaphylaxis. There can be no question of the value of properly prepared autogenous vaccines. If we treat our focus surgically as it should be treated we can hope to secure gratifying results with the vaccines providing we have secured the infecting organism. Our active campaign should be directed toward prevention of the metastatic infection by eliminating the primary focus before the secondary infection takes place, or at least on its first appearance. Many children would be saved from acute rheumatism with the attendant heart lesions and chorea, if the tonsils and adenoid are properly operated early enough. In this connection I need hardly state that we are considering infected tonsils and adenoid only as objects of operative attack. The stump of a partly removed tonsil is frequently an active focus.

The proper treatment of nasal sinus infection should be instituted early. We should not allow our patients to go about with discharging sinuses and discharging ears. Knowing as we do the

evil results so frequently attendant on these primary foci, it is our duty to institute prophylactic measures. Unfortunately, people do not present themselves until they have developed their secondary lesion. If the treatment is limited to rest, drugs, diet, hygienic and mechanical measures, hydrotherapy, etc., they will not be cured, although frequently relieved of their symptoms for a time. These are valuable measures, but unless the focus is found and eliminated they will not give us permanent results.

In closing, I wish to again emphasize the need for a painstaking search for the focus. I have had patients sent to me who had had an examination for the express purpose of locating a focus with negative results. On inquiry I have found that the examination was lacking in technical detail to such an extent as to be valueless. Then again the culturing must be done with exceeding care. The laboratory side of the work is highly important. Unless we approach this work with an acute interest and considerable enthusiasm we will fail to get the results we wish.

My personal experience in the elimination of primary foci and the use of autogenous vaccines has been encouraging. The internist, the general surgeon, the orthopedist, the specialist (ear, nose and throat and dentist) and laboratory man, need to organize their individual efforts in such a way that the patient secures the benefit of co-operative diagnosis and treatment. In preparing the foregoing the literature has been freely consulted and acknowledgment is gratefully tendered to the authors consulted.

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CONNECTING LINKS BETWEEN ENDOCRINOLOGY (THE INTERNAL SECRETIONS) AND OTO-RHINOLOGY.*

DR. HENRY R. HARROWER, Los Angeles, Calif.

On first thought the connection between the internal secretory organs and the ear, nose and throat is not particularly intimate and, perhaps, some of you have felt that the hour this evening might be ill-spent in listening to what I have to say. If so, I hope that you may be pleasantly disappointed, for I believe that the connection between these two branches of medicine is just as evident and as important as those well-defined links between other systems or organs of the body which have become better known as our knowledge of the hormones has increased.

For the sake of convenience I have divided my remarks into two parts, in the first of which I hope to show that a well-marked and fundamental relationship exists between certain of the glands of internal secretion and some of the disorders in your special field and vice versa; and in the second, briefly to consider several profitable phases of organotherapy which specialists such as yourselves may apply quite frequently.

Naturally the thyroid gland would be the first to engage our attention, for it is among the most important of the hormone-bearing organs. The thyroid gland exerts the same influence upon the control of the metabolism in the cells of the structures constituting your province of medicine, as it does in the maintenance of cell nutrition and detoxication in any other part of the body. The great principle involved in the relation of thyroid insufficiency and the condition of cellular infiltration to which extended reference was made when I recently addressed the Los Angeles County Medical Society, is responsible for at least a part of the troubles which you are called upon to treat. Hertoghe himself mentions the frequency with which hypothyroidism is associated with noises in the ears and dizziness; and even Menière's syndrome may result from this condition of infiltration which Hertoghe was the first to direct to the attention of the profession some twenty years ago.

I have encountered several cases of Eustachian infiltration with a degree of deafness which was at least partially due to this disorder,

*An address read before the Eye, Ear, Nose and Throat Section, Los Angeles County Medical Association, May 1, 1916.

which cleared up when the quite generalized infiltration was recognized and its relation to thyroid inadequacy made the basis of the only proper treatment—suitable thyroid medication. It may not be out of place, then, if I should suggest that any of the intractable aural or nasal conditions in which a mucosal or more deep-seated infiltration might be present, should be a signal to you to search for other evidences of thyroid disorder. In case any of them are discovered, and you will recall that they are not hard to identify, suitable organotherapy profitably may be made a part of your treatment. I am not saying that thyroid extract is a panacea for intractable nose and throat disorders or that it is *the* rational remedy for noises in the ears or deafness, I merely suggest that if any of these symptoms serves to direct your attention to an obscure thyroid trouble and you verify it by discovering other symptoms usually expected in this quite common disorder, it is rational therapeutics and profitable therapeutics, too, to exhibit thyroid; and the results will be sufficiently good in some cases to make up for the failures in others and at the same time to convert one to the importance of the diagnostic and therapeutic value of this suggestion.

It should not be necessary to remind you that adenoids are almost invariably found in hypothyroid children, so much so that it is now believed that this relation is not merely incidental, but that the thyroid dyscrasia may have some causative influence in the production of the abnormal growths. This being the case, it seems to be proper when studying adenoid children to look carefully for other evidences of thyroid insufficiency and, when they are found, to treat them simultaneously with the adenoids. With the risk of causing some slight offense by attempting to discuss a subject with which I am not very familiar, I will venture the statement that it is not good practice to treat an adenoid case by the mere physical removal of the offending tissue, while the results of its presence, as well as the possible causative factors, still remain more or less definitely present. While adenotomy undoubtedly gives Nature a better chance to reassert herself, which she practically always makes the best use of, I believe that suitable organo-therapeutic and other measures will give her a still better chance if an insidious thyroid dyscrasia happens to be present.

We shall not have time to enter into a study of the broad subject of the ductless glandular disorders in that large class of cases which McCready, of Pittsburgh, chooses to call "children requiring special attention;" but it must be admitted that the first one to have an opportunity to investigate such cases is the oto-rhinologist, for the

most marked and obvious disturbance calls for your service. Too often this service, usually operative, is all that is given and it is unfortunate. One should treat the whole child and not merely that disorder which obtrudes itself upon the parent, the teacher or the family physician.

I have directed your attention to a few of the conditions in the nose and throat which may be connected with hypothyroidism and before I get away from the thyroid gland, there is another phase of its study that has recently been emphasized. Naso-tonsillar infections are a common cause of thyroid dyscrasias. Those who have the opportunity of studying many cases of goiter, both the so-called "simple" type and more especially the "exophthalmic" type, are beginning to realize that overlooked infections of the mouth, nose or tonsils are closely connected with the incidence of these thyroid disorders. Some reports of work done at the University of Wisconsin are very interesting. Evans, Middleton and Smith¹ examined the mouth, nose and tonsils of three hundred and sixty-two individuals with goiter. In no less than 22 per cent of these there was a tonsillar endamebiasis, while a less marked but indubitable infection of other parts of the mouth and nose was present in a much larger number. The importance of this was proved by the treatment of a number of the cases in which there was a well-marked thyroid dyscrasia as well as a goiter, and out of twenty-three patients treated with emetine the dysthyroidism was favorably modified in eighteen cases.

So just as certain common symptoms that have been mentioned lead us to think of thyroid inadequacy as an etiologic factor in nose and throat disorders, so nose and throat disease may be a cause of well-marked thyroid troubles. The inter-relation is closer than has been imagined.

So far as the application of various phases of organotherapy in oto-rhinology is concerned, we have already mentioned some indications for thyroid therapy. Certainly it is worth applying in some of the old, difficult cases in which one can demonstrate a more or less well-marked hypothyroidism. I need not tell you of the value of adrenalin, but perhaps not many of you have yet had recourse to some other organotherapeutic measures for the prevention of post-operative hemorrhage, especially in nose and throat surgery. The first is the intramuscular injection of pituitary solution as a means of preventing anticipated bleeding. Kahn, in one of your special journals,² states that he gives twelve minims of the standard solution of the posterior pituitary principle fifteen minutes before anes-

thesia is commenced prior to nose or throat surgery. The above dose is for children, fifteen minims or more may be given to adults. The coagulation time is reduced one-third to one-half and hemorrhage is greatly reduced, especially following turbinate operations. The cardio-stimulant influence should be also of much value.

The second anti-hemorrhagic remedy is prepared from brain tissue and has been named thromboplastin and is used locally, being swabbed on the cut surface. It has been extensively used by certain clinicians and further information may be found in the writings of Hess³ and Cronin.⁴

Another interesting and not very well studied phase of organotherapy is the use of lymphatic gland extract in adenoid children. I am not setting this forward as something so valuable that it should not be missed, rather I am relating an experience which seems to hold within it something of ultimate clinical value. If the experiences which follow are worked out—and there are opportunities galore for such investigative work—it may be that some new and illuminating information may be had on the adenoid-tonsil question. Ashby,⁵ of Liverpool, has suggested that the uniform enlargement of the tonsils and especially the growth of adenoid tissue in children at a fairly constant age may be a defensive act of the body, the increased tissue being an attempt on the part of Nature to supply some secretion or substance which is especially needed at this time when adenoid hypertrophy is most usual. The obvious deduction was that it might be possible to give this to the body just as the missing thyroid, ovarian or pituitary substance is of therapeutic efficacy in conditions of corresponding glandular insufficiency. So Ashby gave thirty children one gram of dessicated lymphatic gland each day for a number of weeks. There was obvious improvement, the hypertrophy was reduced, snoring ceased and noises during breathing disappeared. This is but a preliminary report and is surely deserving of further study, for the opportunities are so numerous and the possibilities quite considerable.

Your secretary reminded me to be sure to include something of interest to the ophthalmologists, and before closing, a word or two of possible interest to them may be added. Several important eye conditions may be connected with ductless glandular disorder. One of them is not yet well differentiated for it is in the long category of troubles either due to or associated with hypothyroidism. It consists of a fairly well defined asthenopia of obscure origin with a train of symptoms which is doubtless familiar to you with muscle weakness predominating. This is not an uncommon condition, and

when the progressively decreasing powers of vision are not directly connected with a reasonable cause, and, for that matter, even when a cause is quite well defined, it is well to look for other symptoms such as those previously mentioned as being due to thyroid inadequacy. In such cases carefully graduated thyroid medication may be of quite considerable help.

I need but mention in passing the eye findings in exophthalmic goiter, a typical internal secretory dyscrasia, the treatment of which is usually out of the province of the ophthalmologist.

One of the most interesting ocular disorders is the bitemporal hemianopsia now known to be due to pituitary disease. Not uncommonly the ophthalmologist is the first to meet these cases, for the sudden or progressive visual disabilities naturally call for his aid first. It may be well to outline in all brevity the eye symptoms of well-marked pituitary disease. The enlarged gland in its sellar cup causes fairly uniform neighborhood symptoms—we are not now interested in which part of the gland may be involved, nor what type of pathological changes may be present and what varying secretory dyscrasias result therefrom—and the chief among them affect the sight. The first of these is due to the direct pressure upon the optic chiasm with either primary optic atrophy (I think this term is incorrect as we may shortly see) or, more usually, bitemporal hemianopsia. This blindness varies in degree and rapidity of onset, but more often first affects the visual acuity for colors only, and later for form as well. Professor Cushing very kindly sent me last week a valuable monograph by himself and C. B. Walker,⁶ in which the distortions of the visual field from brain tumors are interestingly considered. The conclusion of this study is worth reiterating: Detailed perimetry with small test objects of several sizes is advocated for patient with pituitary disease in order that stages of hemianopsia antecedent to those usually recognized may be detected.

The other eye symptoms are found in more marked cases, i. e., when the pituitary tumor extends beyond the sellar edges. In such cases there may be paralysis of both of the external recti with resulting internal strabismus due to pressure on the sixth cranial nerve, or by similar pressure on the third cranial nerve external strabismus may result. Still later the increased intracranial pressure will cause choked disc and ultimate total blindness. This condition and the so-called "primary optic atrophy" (of pituitary origin) does not necessarily mean an anatomical degeneration of the nerves, but according to Cushing (*loc. cit.*) it is very often only a "physiological block to the transmission of the visual impulses" which

may be relieved speedily by decompression or other more serious surgical measures.

As in all other phases of medical endeavor the ramifications of the internal secretory threads are closely intertwined with every phase of physiological activity and as the skein is unravelled and our understanding of these interrelations becomes more comprehensive, there comes a better control of many conditions, the treatment of which has been beset previously with seemingly insurmountable difficulties. Enthusiasm in the study of the internal secretory organs and their disorders is not to be scorned, for it leads one into fields in which many of the flowers "born to blush unseen and waste their sweetness on the desert air" may be viewed, handled and appreciated as never before.

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Sarcoma of the Ethmoid; Operation. W. M. MORRISON, *Proc. Roy Soc. Med., Laryngol. Section*, Jan., 1916.

Patient, a female, 20 years old. Pain about the right eye and swelling in the region of the nasal process of the right maxilla. Some right-sided nasal obstruction. Examination of a piece of tissue from the ethmoidal region showed it to be one of sarcoma. Operation through Moure's incision, the nasal process removed and the ethmoidal cells opened; these were found to be filled with soft growth and finger-like processes projected downwards and hung into the antrum. The origin of the growth appeared to be from the lining of ethmoidal cells. The whole growth seemed to be encapsulated and came away easily. No recurrence (one year).

P. F.

EDITORIAL DEPARTMENT

PERORAL ENDOSCOPY AND LARYNGEAL SURGERY.

Edited by

DR. CHEVALIER JACKSON, Pittsburg, Pa.

RADIUM.

D. Bryson Delavan has written a paper (Transactions American Laryngological Association, 1916) that will be welcomed by all laryngologists who are endeavoring to form an opinion on the value of radium therapy. The literature of the subject and the data obtainable verbally are all so conflicting, even chaotic, that the impartial resume by one of our foremost laryngologists is welcomed by all. The paper, which is brief, considering its importance, should be read in full. We take the liberty of summarizing as follows:

1. "Vernal catarrh" has been absolutely cured and patients thus treated have remained cured as long as ten years. Radium here seems a specific.

2. The selective action of radium on lymphoid growths, such as lymphangioma of the tongue is emphatically specific.

3. The treatment by radium of papillomata of the larynx is being attended with ever-increasing success.

4. Leucoplakia of the tongue is capable of cure by radium, but much judgment and skill are necessary to attain good results in any lesion in the mouth.

5. Tumors of the larynx of various kinds have been caused to disappear with complete return of the singing voice.

6. In malignant disease the reports are somewhat conflicting. Some observers reporting that the "treatment does not seem to have much effect in arresting the disease," but Dr. Delavan regards it as quite significant that this same report adds "under new methods of application better results may be expected." He reports two cases observed by himself in both of which the interior of the larynx had been invaded probably from an extrinsic focus. Both were inoperable. After exposure to large doses of radium the first effect noticed was the immediate control of the troublesome secretions which lost their fetor and ceased; the areas of ulceration rapidly diminished in extent, and in the less severe of the two cases disap-

peared, while in the other case they seemed to do so. Infiltrations diminished and became soft, the voice became clearer and deglutition improved so that both patients were able to swallow without pain a largely increased variety of food; digestion became normal, sleep more prolonged and restful, strength steadily increased, and there was an almost normal condition of good spirits. One patient, a physician, was able to resume office practice and operative work for a period of over two months. Both these patients agreed that if the outcome of the disease should be entirely unfavorable the benefits gained in the relief of suffering and the added comfort afforded would well have repaid them for any inconvenience the radium had caused, whether from burns of the skin or other effects.

7. A knowledge of the use of radium in general is still in its infancy. The failure to gain uniformly successful results is in all probability due to imperfect knowledge (a) of the methods by which the radiations can be controlled, (b) of the amounts of radium which should be used, (c) of the correct duration of the exposures, and (d) of the proper screening of the rays. It has certainly been proved that radium will destroy a superficially located cancer cell. Granting this, it is by no means impossible that with increased knowledge of its action, and skill in its application, deeply seated cells may be successfully reached and destroyed.

The location of the larynx so close to the skin surface would seem to render it particularly amenable to treatment by cross-firing with Roentgen rays externally in combination with radium within the larynx, though as yet no reports of extensive experiments in this direction have appeared. Our work, though encouraging, is not yet completed. The great advantage of the combined Roentgen ray and a radium therapy elsewhere in malignancy has been reported upon by a number of writers, notably by Dr. Russell H. Boggs (*American Journal of Roentgenology*, February, 1916) who states that while cancer of the tongue and buccal membrane are less influenced by radium than cancer in almost any other situation, yet with the combined radiation excellent results were obtained. The results were better when the treatment was given in divided rather than massive doses, with a view to allowing the normal tissue to recover. In all cases, except epitheliomata on the tongue or in the throat, Dr. Boggs advocates massive doses given as quickly as possible. In epithelioma of the lower lip with the combined radiation he has been able to eradicate malignant disease in the lymphatics more thoroughly than can be accomplished by surgery in

the more extensive involvements. He states that it is necessary for the operator to know the relative value of radium and the Roentgen rays when combining these two agents. How often both forms of radiation are to be repeated must be determined by the judgment of the radiotherapist who "must be also a clinician." It is to be hoped that the combined radiation will be extensively experimented with in inoperable laryngeal cancer. Of course, no one familiar with the marvelous results of those rare cases of cancer of the larynx seen in the stages adapted to thyrotomy would think of advising any other method of treatment; but, unfortunately, nearly all cases have reached the inoperable stage by the time a diagnosis is made. As urged many years ago by Semon, all laryngologists should continually preach the necessity for early diagnosis in all laryngeal growths. It is almost a crime to treat for months without a diagnosis any laryngeal condition that could possibly be malignant.

Anyone who has to deal with malignant disease will profit largely by reading the excellent article on "Intensive and Deep Roentgen Therapy," by Dr. George C. Johnston, in the journal above referred to.

Common Disease of the Ear. Their Early Recognition and Treatment. S. MACCUE SMITH, *New York Medical Journal*, Vol. CIII, No. 2, Jan. 8, 1916.

Acute otitis media is the starting-point of some of the more serious ear conditions. Therefore, the careful examination of the ears, especially in children ill with influenza, pneumonia, and the exanthemata is essential. The early recognition and early incision of the membrana tympani is of great importance. If the ear is left to rupture, the drainage is inadequate and the condition becomes chronic. When symptoms of acute mastoiditis develop, if they do not respond to the application of ice and such simple measures, operation should be done and not wait until the late symptoms have developed.

PACKARD.

SOCIETY PROCEEDINGS.
NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

Regular Meeting, February 23, 1916.

DR. HENRY L. LYNCH, *Chairman.*

Laryngeal Stenosis Following Removal of Papilloma; Cured by Dilatation and Rogers' Intubation Tube. DR. THOMAS J. HARRIS.

Dr. Harris said he had brought this little lad before the Section in order to illustrate several points of interest and fruitful for discussion. This child came to his service at the Post-Graduate Hospital three years ago. At that time he had already been operated upon partially, but the child was still suffering from hoarseness of voice, though with little if any difficulty in breathing. The laryngeal examination showed a mass of papillomata. At that time, he was exceedingly enthusiastic about the use of radium and thought this was a suitable case for such treatment. Under cocaine, the child permitted the introduction of radium for twenty minutes. Unfortunately, the papillomata obstructed the breathing so that the radium could only be kept in for a minute at a time; accordingly it was not very satisfactory; there was some improvement, but not much. The radium was again applied later, but not very satisfactorily. As the result of these two applications of radium, there was some shrinking of the growth in the larynx, but the result was not considered satisfactory. The boy remained in the hospital for a time and was in pretty fair shape when discharged, so far as breathing was concerned. That was in the summer of 1912. Later, Dr. Forbes had to take him into the hospital again, for difficulty in breathing. At that time, under general anesthesia, he treated the case with fulguration. Fulguration was used on three different occasions, but equally unsuccessfully.

When Dr. Harris returned from Europe, he found the child still in the hospital, and feeling that the lack of success might be due to the failure of exact application, he determined to tracheotomize the child. This was done, after which radium was applied for twenty minutes, but with an equally unsuccessful result. In the course of the tracheotomy, the anesthesia gave trouble, and it was necessary to complete the tracheotomy hurriedly, and the cricoid ring was cut, which gave a great deal of trouble. The child was in the hospital for some months. Every time an attempt was made to take out the tube, it gave trouble, for the bolster on the posterior wall immediately shut off the breathing. After the child had been in the hospital for a number of months, it was decided to suspend him and remove the papilloma. This was done under rectal anesthesia, and the growth was thoroughly removed. In spite of that, the tube could not be removed, and he wore it for a year or more, every attempt to remove it being a failure. The granulation tissue would reform, and there was a distinct deformity in the larynx with laryngeal stenosis. Finally, Dr. John Rogers was asked to see the case, and he felt that if the stricture could be dilated from the tracheal opening there was an excellent chance for a cure. Dr. Rogers did this under general

anesthesia, using urethral bougies, and running the size up very rapidly. When had gotten the proper opening, he introduced his modified intubation tube, which was kept in for a month at a time; then taken out and cleaned. At the end of five months it was removed. That was some five or six months ago, and the larynx has remained open since. The boy is going to school and there has been no trouble with his breathing, and no recurrence of the growth.

The case was interesting for many reasons:

1. The failure, so far as the use of radium is concerned. He had been fortunate in using it in other cases, and papilloma of the larynx seems to be an ideal condition for such treatment.

2. It was an ideal case for suspension and rectal anesthesia. One can only speak in the highest terms of the use of rectal anesthesia in such cases.

3. Finally, the serious results that follow hastily and improperly performed tracheotomy. The back of the larynx itself was cut, which caused all sorts of trouble and accounted for the delay in the cure.

The method of treatment which Dr. Rogers adopted, and which has since been used in other cases, succeeded admirably—the rapid dilatation through the tracheal wound, afterward followed by the introduction of a properly adjusted modified tube.

Dr. Harris said he made no claim for a prompt and complete cure as regards the return of the papillomata. He had seen them recur even after operating upon them externally; but after two years there has been no recurrence, and he hopes to be able to report continued freedom. The boy has a fair voice, which will probably improve later. In other cases upon which he has operated there has been steady improvement, and one little girl operated upon some time ago has very fair voice.

DISCUSSION.

DR. QUINLAN inquired concerning the condition of the boy's nasopharynx. He had noticed that the mouth was open while the boy was in the room.

DR. HARRIS replied that he did not remember that anything had ever been done for the boy in that respect.

DR. QUINLAN said he wished to emphasize that feature of nasopharyngeal obstruction, for the children have to breathe with open mouths; and there is a sort of compensation or hypertrophy which sometimes results in the pathological conditions seen in these patients.

DR. MCCOY said that the case interested him very greatly because about a year and a half ago he had reported a case of papilloma of the larynx which was under observation for two years. The boy was five years old when first seen, and gave a history of defective breathing for a year and a half before that. When he first came under treatment he was quite dyspnoeic. After inserting a tracheal tube, the growth was removed by direct laryngoscopy, and two months later the tonsils and adenoids were removed. Then, at some twelve or fourteen subsequent sittings, fulguration was applied through a direct tube, each time under light chloroform anesthesia. The tracheal tube was removed at the end of about twelve months, the tracheal tube was closed, and the larynx was healed with a thickening and fibrosis. After going through this case he came to the

conclusion that the best treatment for these cases of multiple papillomata which have a vicious tendency to recur, is to do a tracheotomy at once and either leave the growth absolutely alone or practice some such treatment as fulguration or radium. The danger of surgery in these cases is that one cannot tell when the growth is removed down to normal tissue, and there is a possibility of cutting too deep in the effort to thoroughly eradicate the growth, which would later result in contraction and deformity. These cases seem to run their course of viciousness in from six to eighteen months, and then tend to become quiescent and finally to disappear. If left alone during that time with practically no other treatment unless it be the application of fulguration or radium the case will probably get well.

DR. FORBES said he wished to emphasize one point which he thought Dr. Harris had not thought of; in the summer of 1912, when Dr. Harris was away, the first suspension laryngoscopy was made, and it was possible at that time to make a thorough application of the radium, using rectal anesthesia. The radium was loaned by Dr. Abbe, and it was kept in place for 28 minutes. It gave an ideal application. That same afternoon he used the same radium with the suspension method on an adult under cocaine anesthesia, and kept it applied for 23 minutes. The radium was applied in this second instance to a papilloma of the cord and this case was cured practically with one application, though with the boy the treatment was apparently negative in its results. So far as Dr. Forbes knew, that was the first use of radium made with suspension laryngoscopy in the city.

DR. QUINLAN said that it would be interesting to know the present opinion of the members in regard to occurrence of papillomata as compared with that of 15 or 20 years ago. In his experience, papillomata of the larynx was a rather frequent condition twenty-odd years ago, whereas to-day it is comparatively rare. He used to see these growths budding up along the larynx very frequently; to-day this picture is not so frequent. Probably the attention which the sinuses have received and the removal of tonsillar tissue in the vault and fauces as well as other conditions of obstruction within the nasal spaces had much to do with the infrequency of this condition.

DR. MCCOY said that another point occurred to him. Dr. Harris had stated that he encountered a good deal of trouble with granulation tissue forming in the wound. When tracheotomy is done in these cases, it should be performed very low down, as far away as possible from the larynx, for the granulation tissue following in the tracheotomy wound after the removal of the growth in Dr. Harris' case was probably papillomatous tissue, which obviously forms a very unpleasant complication.

DR. VOISLAWSKY said that he could not answer Dr. Quinlan's inquiry in regard to the comparative frequency of papillomata now as against some years ago, but that he had had quite a little experience with the use of radium in these cases in the last few years,—perhaps the same tubes that Dr. Harris and Dr. Forbes had used—Dr. Abbe's. In his opinion, radium cures according to the age of the patient—the older the patient, the easier it is to cure the case with radium. One application of radium for thirty-five minutes in the larynx of a man of seventy, absolutely cured the case in thirty days. In another case, a man of thirty.

five, treated under suspension laryngoscopy and ether anesthesia by an application of thirty minutes was absolutely cured of his papillomata. But with children it was different. In one case an application of radium of about forty minutes to multiple papillomata has not been so successful, in so far that the papillomata have returned; repeated applications were necessary. On his experiences he bases his assumption that the older the patient, the easier the cure with radium, and the shorter the length of the application.

DR. CARTER remarked that the same could be said of any treatment of papillomata of the larynx. In a case which he himself had shown before the Section four years ago,—a patient from North Carolina, first seen by Dr Gleitsmann,—all of the papillomata were removed by the snare and forceps. The man was apparently dying from asphyxia when first seen by him. He had a large cauliflower papilloma. Only three weeks ago he had heard from this patient, and there had been no recurrence of the growth. It seems probable that operative treatment when properly carried out is effective in the adult cases.

DR. LYNNAH said that six or seven years ago two cases tracheotomized for laryngeal papillomata were admitted to the Willard Parker Hospital, one suffering with diphtheria and the other with measles; both cases came from the service of Dr. Coffin at the Manhattan Eye, Ear and Throat Hospital, one of them a little girl who had worn a tracheal canula for eighteen months, and the other a boy who had a canula in the trachea for sixteen months; both children were unable to remain without the canulae when they were removed and immediate recanulation was necessary. I obtained permission from Dr. Coffin to treat the cases by dilatation and both cases were dilated with a bulbous tracheal which pressed on the posterior tracheal hypertrophy and dilated the trachea at the site of the stricture. At the end of two months the tubes were removed; the little girl remained without the intubation tube and had no further difficulty, but the boy was reintubated owing to spasm of the adductors. At the end of the third month after intubation the boy also made a perfect recovery. While the tracheal canulae had rested the larynx, there was production of cicatrix tissue at the site of the tracheal fistula which made decanulation difficult. Both patients are still alive and well and have no recurrence of the papillomata and have good voices. In Dr. Harris' case, so far as he could see with the laryngeal mirror, when the boy gagged the right arytenoid cartilage was ankylosed and did not swing towards the median line as well as the other. This condition of ankylosis in separation or abduction frequently occurs after the larynx is dilated with a wide neck tube such as the one used by Dr Rogers. This is rather fortunate for the cords and ventricular bands remain widely separated and adductor spasm is overcome. The voice is rather weak at first and similar to the voice of the boy presented by Dr. Harris, but after one or two years the constant pull of the bowed cords and ventricular bands make the arytenoid cartilages functionate and the freely movable arytenoid is not always necessary in the production of the adventitious vocal band as described by Dr. Jackson.

Chronic Stenosis of the Larynx; Tracheotomy; Decanulation After 18 Years. DR. C. J. IMPERATORI.

(To be published in a subsequent issue of THE LARYNGOSCOPE.) ...

DISCUSSION.

DR. LYNNAH said that the case presented by Dr. Imperatori was the most remarkable that he had ever seen, and it certainly was a record case for having worn a tracheal canula for eighteen years and finally be decanulated with such a perfect result to the larynx after having had a stenosis of such long duration.

He had had the good fortune to see this patient with Dr. Imperatori at the Manhattan Eye, Ear and Throat Hospital at the time he was dilating the larynx with intubation tubes. The failure of the patient to tolerate the tube with any degree of comfort was due to the fact that the head of the intubation tube was too large to fit the laryngeal pouch properly and held the epiglottis upward so that fluids and food readily entered the lumen of the tube and caused considerable discomfort and frequent choking spells during the act of swallowing and it was therefore necessary to remove the intubation tube and replace the tracheal canula.

While we all know that the epiglottis has little to do with preventing fluids and foods from entering the larynx and is often completely amputated for the relief of dysphagia in tuberculosis of the larynx, and that the sphincter muscle of the larynx closes the orifice and prevents food from entering it during the act of swallowing, at the same time I wish to emphasize the fact that the epiglottis has considerable function when an intubation tube is in the larynx preventing the sphincter muscle from acting, and if the head of the tube is too large to fit the cavity of the larynx properly and the epiglottis is unable to close over the lumen of the tube during the act of swallowing, the patient will naturally suffer great discomfort and the tube will have to be removed. An adult will never tolerate an intubation tube unless particular attention is given to the size of the head of the tube and the size of the laryngeal cavity into which it is to be placed. In two cases of syphilitic stenosis of the larynx that he had treated by dilatation in whom the epiglottis had sloughed off, the intubation tube could not be tolerated until these patients were fed by the gavage method with a catheter passed through the nose into the esophagus.

Luetic Necrosis of Upper Jaw and Nose: Exhibition of Sequestrum.

DR. JOHN D. KERNAN, JR.

The patient was a woman 35 five years of age, who came to Dr. Chappell's clinic a year and a half ago, with a history that four and a half weeks previously a dentist had removed a tooth, and that was followed by extensive necrosis of the upper jaw. Dr. H. S. Dunning removed a part of the alveolar process and part of the hard palate. She went away prepared to sue the dentist. The Wassermann reaction was 4+. Some months later she returned with a huge swelling over the nose, which ruptured spontaneously and discharged pus. That was a year ago. She was then put under vigorous anti-specific treatment,—salvarsan with mercury at intervals, and a large amount of potassium iodid. Wassermann is still 4+. A month ago through the sinus and bridge of the nose a sequestrum was removed consisting of a portion of the frontal bones, the nasals and a portion of the mes-ethmoid.

Dr. Kernan said he would like to know how to get the Wassermann negative.

DISCUSSION.

DR. MACKENTY said it was a remarkable case. At one time he had had under observation for a good while a case of a child with a sequestrum. Syphilis could not be demonstrated, but the whole upper jaw was one sequestrum. In practically all these cases of the upper jaw, syphilis is the cause. This child was finally lost sight of.

The question of why you don't get a negative Wassermann: The reports come in 50 per cent. negative. Dr. MacKenty said he did not know what they put in the salvarsan. His experience is that after repeated doses if he gets a negative, in the old, long-standing cases he is surprised.

DR. MCCOY said that in a talk with a dermatologist who has had great experience in syphilis, he derived the impression that if a case of syphilis is seen early and treated within the first few months there is a very good chance of establishing a permanent negative Wassermann; but that if systematic treatment with salvarsan and mercury is not established until after a year or two,—or if there has been more or less indifferent treatment,—it is difficult to get the patient into a state of permanent negative Wassermann; he will have a period of negative reaction, and then will have a period of positive Wassermann. A case that has gone as long as this case of Dr. Kernan, is probably tertiary syphilis. Syphilographers are not hopeful of such cases.

DR. KERNAN, replying to a question as to whether the patient had any active lesions, replied in the negative. While they had not been able to get a negative reaction, the condition was controlled.

A Case of Lupus Treated by Radium. DR. JOHN MCCOY.

The patient was a woman, 29 years of age, who came to Dr. McCoy's office a year ago, having been referred by a dermatologist. The history was that about twenty years previously she had had a sore in the nose. She went to a number of physicians, who treated her principally with salves which did not seem to influence the course of the sore, and up to about eight or nine years ago the tip of the nose was gradually eaten away. At that time, the skin also was sore. She applied to Dr. Fordyce and he treated her from the start with x-ray. He applied this treatment for several years,—at first about once a week, and later about every two or three months. That seemed to heal the external skin lesion, but seemed to have no influence on the internal mucous membrane lesions.

When first seen by Dr. McCoy, the septum was mostly gone; in front was a mass of granulation tissue of a typical tubercular nature; there was secretion coming from the turbinates on both sides, and apparently from the ethmoid region, and she was in constant misery. The inferior turbinates on both sides were also invaded, and the whole mass was pouring out muco-purulent secretion. She was in a very depressed condition. As the x-ray seemed to do so well on the external condition, Dr. McCoy thought that perhaps radium might arrest the internal condition, so on January 30, 1915, 20 mg. of pure radium were applied, screened with aluminum 1 mm. thick. This was allowed to stay in the nose for two hours. A week later 20 mg. were applied for one hour, and still a week later 10 mg. of naked radium, for one hour. This did not seem to produce much reaction. After the third application, there was a very noticeable diminution of the amount of discharge and a noticeable im-

provement in the appearance of the interior of the nose. On the 20th of February, a fourth application was made, consisting of 15 mg. of naked radium for two hours. That seemed to stimulate healing very well, for she was nearly cured a week after that. On the 13th of March, 20 mg. of naked radium was applied for two and a quarter hours. That cured the whole condition; the nose is dry, and there has been no discharge since.

An interesting feature of the case was that about seven or eight months afterward she developed a patch near a bad tooth which was also pronounced a lupus by Dr. Fordyce; but this disappeared under three applications of radium. The case seemed interesting in view of the fact that the x-ray did the work externally but had no effect internally, and that radium acted so beneficially when applied inside the nose.

The patient was now receiving tuberculin injections, to prevent recurrence, and he asked if any of the men had tried tuberculin for this condition. The patient was very anxious to know whether she would have any more lupus. She is having injections once or twice a week, but it will take some time to determine what the result will be.

Laryngectomy for Carcinoma. DR. JOHN MACKENTY.

Through the courtesy of Dr. Phillips, this patient was first presented before the Section in December of last year, and was under observation in the wards for two weeks in order to determine the nature of the condition. She showed nothing in the lungs. Watching the growth carefully, it was decided that it was malignant, and the patient was operated upon in January, 1916, a total laryngectomy being performed. She had the usual hoarseness of these cases, the hoarseness increasing for several months; she had no pain of any kind, simply the increasing hoarseness. The growth was in the commissure, more on one side than on the other, and extended across the commissure, and slightly into the mouth of the esophagus, over the posterior part of the commissure. The operation was performed through a straight incision, the one Dr. MacKenty prefers when not removing the glands of the neck. It is easier to do the operation if the lateral incisions are also used, but if used, especially if the glands of the neck are taken out, there is more sloughing than with the straight incision. During the operation the trachea was protected by inserting into it a light feeling rubber tube of large size and about 8 inches long. Through this tube the insufflation anesthesia was given with a Janeway appliance.

The large tube in the trachea prevents the blood from gravitating into the lungs. The larynx was removed from below upward. On reaching the growth, half an inch of the mucous membrane was removed from the esophagus. Dr. MacKenty thought it would be possible to remove quite a little of the esophagus, and yet not destroy the deglutition. As usual when the pharynx is opened, there was some sloughing. Once the pharynx is opened, it is almost impossible to get primary union. In some cases the sloughing is so extensive that the floor of the mouth does not close, and it has to be closed later. The plastic should be delayed until the edges of the defect have become thoroughly healed and clean.

A picture was shown giving the appearance of the wound three weeks after the operation,—the tracheal wound below and the skin open wound;

above and outside the skin wound were two little holes, one opening into the pharynx and the other into the hypo-pharynx.

Another picture showed the method used to keep the secretion from getting into the wound behind. On the outside and around the neck of the inner tracheal tube is placed a rubber dam which catches the secretions coughed up from the trachea. That is important, in keeping the wound as clean as possible; otherwise the secretions will get in behind and contaminate the wound. It is an extremely important point in the treatment of these cases. Another important point is the employment of suction to relieve the patient from the secretion that occurs in the trachea. The secretions rattle up and down in the trachea, and tend to gravitate into the lung and produce pneumonia; accordingly suction is applied through a catheter into the trachea every half hour or hour for several days, to remove the secretion which the patient cannot get rid of unaided. In that way, Dr. MacKenty has succeeded in avoiding pneumonia in these cases. This is the 14th case that he has operated in this way,—8 total and 6 hemilaryngectomies, with no operative deaths.

Another point in the after-treatment is the method of feeding these cases. In the photograph which was passed around the tube could be seen in the patient's nose. The tube is put through the nose into the esophagus at the time of operation and left in place until the wound has healed. If there is a large opening in the neck, the patient can be fed through the open esophagus, but if the opening is small the tube is left in through the nose. In one instance it remained in place for two months. Dr. MacKenty said he had asked Dr. Jackson and others how long the tube could be left in the esophagus, and Dr. Jackson said he had left it in for three weeks, but that he did not know how long it could be left without injury. The patient is fed a full diet from the very beginning (balanced diet) of butter, oatmeal, milk and sugar. Thus starvation and the acidosis of starvation are not added to the balance against recovery.

This patient is able to go without the tracheal tube most of the time. She is wearing a tracheal canula at night in order to keep the wound open until contraction is complete. This will be a great advantage later, for the tracheal canula continuously worn does produce a great deal of irritation. If good union is secured between the skin and trachea, the patient can probably go without any tracheal canula. This was the case with a patient referred by Dr. Harris last summer.

Replying to a query from Dr. Quinlan as to how many of these patients are alive, Dr. MacKenty said that four were still alive, of the hemilaryngectomies. The eight total laryngectomies were done for very early cases. The patient showed to-night he considered to be a very bad risk. One case upon which he operated a year ago last December, was a very remarkable case. The patient had a larynx full of carcinoma. She was sent to the Manhattan Eye, Ear and Throat Hospital by Dr. Howell and operated upon there. She had been wearing a tube in the trachea for six or eight weeks. The carcinoma had come through and perforated the thyroid on one side, and the operation was done simply to relieve the suffering, without any hope of her recovery. That was fourteen months ago, and she had been presented at the December meeting. She had gained forty pounds, was apparently well, and had had no recurrence to date.

The eight total laryngectomy patients are still living, because they were operated upon early. Two of the hemi-laryngectomy patients are

dead; the others are still living. These 14 cases were operated during the past four years.

DISCUSSION.

DR. CARTER asked Dr. MacKenty if he preferred laryngectomy to the endolaryngeal operation, and if he believes that a laryngectomy should be performed as soon as the diagnosis is made.

DR. MACKENY said that, in his opinion, unless the growth is small and well localized, the only operation to be considered is total laryngectomy. Hemi-laryngectomies have a limited range of application. He does not think much of the intra-laryngeal work. One has to go pretty wide to get away from cancer; and he does not think that taking away the mucous membrane from the cartilage is much assurance against recurrence. He had never seen a case so treated that did not recur. Unless the growth is very mildly malignant, he prefers the total laryngectomy. When it is near the anterior commissure or well forward, a hemi-laryngectomy may be done, and the patient may have a fairly good voice.

DR. CARTER said that his question was suggested by the fact that some men claim that as long as the cancer is confined to the cartilaginous laryngeal box it is less apt to spread into the tissues, and that if the cancer is confined to the larynx, endolaryngeal methods are better. It is claimed malignancy never invades cartilage; it erodes, but does not invade it.

DR. QUINLAN asked how many of the cases of total laryngectomy had adenopathy. Were the glands of the neck involved any of them?

DR. MACKENY replied that one of the cases had involvement of the glands. He had tried to have that patient here to-night, but failed. When the glands are involved, the case is practically hopeless, although in such cases he would operate to prolong life.

Replying to Dr. Carter's remarks about the cartilage, he said that in the case he had spoken of the cartilage was affected; the whole thing showed malignant disease. He did not believe in the dictum that all cancerous growths can be removed by intralaryngeal methods safely. He would not trust to the cartilage not becoming malignant, with growing cancer. It is much safer to remove it, and it does not do much more harm to the voice to remove the cartilage than the mucous membrane.

DR. QUINLAN asked Dr. MacKenty what had been his experience with radium.

DR. MACKENY replied: Bad.

DR. CARTER asked if Dr. MacKenty did not think that there was great danger in opening up the laryngeal box by the window resection? Is such a procedure ever advisable? Is there not danger of transplanting the growth and adding to the gravity of the situation by favoring the spread of the cancer beyond the confines of the larynx?

DR. MACKENY replied: No, providing you cut wide of the growth.

DR. KERNAN said that he had operated on a man by thyrotomy last June, and within two months the cancer was back in the larynx again. He again operated, this time doing the window operation, going very wide of the growth and removing part of the right thyroid cartilage and some of the left. Within a week the man could speak very well, but in two months he had a carcinoma again. Then a total laryngectomy was performed, and so far the local result seems decidedly more satisfactory, although now he seems to have carcinoma of the stomach. Perhaps if a

total laryngectomy had been done in the first instance it would have been better for him. The surgical principle to go wide of the growth and go in early, applies to cancer of the larynx as well as to any other cancer.

DR. MACKENTY said he was very glad to receive some backing in regard to his radical methods. He believes more and more in doing a total laryngectomy and in doing it early.

DR. HASKIN said that he had been very much interested in this work of relieving nasal obstruction by orthodontia, and had read an article on the subject in 1912. It had seemed very strange that in New York, Dr. Bogue is the only man who will undertake the rapid spreading of the jaw. It has been done in the Middle West with remarkable results, for years. He had read of a case in Cleveland operated by Dr. Price, with almost miraculous results. Dr. Price had spread the jaw of a semi-imbecile child, who suffered from lack of development of the upper jaw, so that there was room for two central incisors which were inserted on a retaining fixture. A photograph was taken before any work was done, and for each succeeding six months during a year and a half, and the result was astonishing. The boy, instead of being a mere mass of protoplasm, became a live wire, and instead of being graded with eight-year-old children, he caught up with children of his own age. This was the widest-spreading case he had seen reported and the most wonderful result had been obtained.

This thing can be done. The dentists in New York are mostly Angle School men, and at the Manhattan Eye, Ear and Throat Hospital that method has been proved to be a failure for the relief of nasal obstruction, after three and a half years of trial.

The superior maxillary bones are the only ones that are connected with the teeth; the posterior nares are formed by the sphenoid, palatal and ethmoid bones of the skull, and do not affect the facial development, and consequently one rarely ever finds any appreciable variation in the posterior nares. He, himself, had never seen appreciable variation in over 1,500 skulls, whereas the anterior nares show many variations, for the development of the face takes place in the superior maxillary bones which hold the upper teeth, and if these do not erupt regularly the whole face is thrown out of alignment. (Demonstration.)

Rapid Maxillary separation is possible and is of very great value. It should be viewed as a surgical procedure. In many cases there is a great need for the relief of nasal obstruction; the submucous operation will not give it; the obstruction is not in the septum but in the narrowed nasal passages, and by widening these the relief will be almost instantaneous. One rarely sees a nasal obstruction of this kind where there is not bad occlusion, and even if the patient cannot go through a long course of treatment for the restoration of occlusion, by spreading and widening the upper jaw you have him actually in better condition of occlusion than before. In the majority of these cases, the lower jaw is wider than the upper jaw, which is the reverse of what it should be, and rapid spreading puts the upper teeth in a more normal occlusion than before, even without further adjustment. It is very valuable and necessary to get occlusion where possible, but in all these cases there is bad occlusion at the beginning, and you are making a bad thing better. Men are just beginning to wake up to a realization of the importance of these cases of bad

occlusion; they all have early decay, and pyorrhoea, because of the bad occlusion of the teeth, is apt to begin early in life. The nasal obstruction can be relieved easily, rapidly, painlessly, and satisfactorily by rapid spreading, but in the opinion of the speaker, it is seldom if ever accomplished by the Angle method of the slow moving of the teeth. What happens in the line of suture can easily be demonstrated on any dry skull by forcing a chisel into the median line between the central incisors and carefully prying the maxillae apart. These bones first separate, and then the palato-maxillary sutures will yield, as could be seen on the two skulls presented.

DR. QUINLAN asked how long Dr. Bogue had been doing this work, and how much longer than Dr. Quimby.

DR. BOGUE replied that his first case was done in 1871, accidentally, of course. Dr. Quimby also did his case accidentally, as he told Dr. Bogue himself.

Dr. Bogue said the oldest case he knew of what a man, fifty-two years of age, a physician. He saw this case two or three years after the beginning of the operation, which was done by a man who had never done one before. Dr. Bogue said that he himself would not have dared to attempt it. His own oldest case was less than twenty years of age.

Dr. Haskin had stated what was quite true, that usually the lower row of teeth (he said the lower jaw) is considerably larger than the upper when there is contraction of the nares. The night Dr. Swain of New Haven had discussed Dr. Bogue's paper he realized and acknowledged that probably the withdrawal of the tongue from the roof of the mouth had caused a dropping in of the arch. If that is so, there must be a cause for it. That is usually adenoids; but whatever withdraws the tongue from the roof of the mouth, whatever causes mouth-breathing, will invariably cause a contraction of the upper dental arch, which is a diagnostic symptom, for there is always with a contraction of the arch a diminution in the width of the nasal passages, and an interference with drainage and very frequently there is a flexure, which all of the men of the Section would like to see corrected.

The process of correction involves the bending of the bone as Dr. Haskin has shown on the skulls that he passed around. If it is easy to bend the grown skull, how much easier to do it in a young person where the bone is not so hard. When the Angle method is used, as Dr. Haskin has said, it is invariably a slow process, and that involves solution of the bone on the far side of the pressure and eventual deposition on the hither side. You want a rapid bending of the bone, and Dr. Black, of Milwaukee, claims that the suture is spread by this rapid process that you see to-night, and that being done, the edge of the septum may well drop down into the cleft. That was the case, as I understood, with Dr. Quimby's daughter—the nasal septum straightens out of it is allowed to drop between the two sides where it has been spread.

Carcinoma of the Esophagus Perforating Into the Right Bronchus. DR. JOHN GUTTMAN.

S. F., 60 years old, was suffering from slight indigestion and constipation for the last ten years. His present illness began in September, 1915, when he began to cough and expectorate bloody sputum. His family physician on examination found dullness and moist rales in the right

supra- and infraclavicular regions and the patient was sent to the mountains with a diagnosis of pulmonary tuberculosis. He returned after four weeks much improved but his family physician again found the same findings and a temperature of 102. On his way home the patient was seized with a severe hemorrhage so that he had to be transported by ambulance to the hospital, where the diagnosis of tuberculosis was also made. However, repeated sputum examinations proving negative, suspicion of sarcoma was aroused and an x-ray picture accordingly taken and this showed a marked shadow in the upper part of his right lung. A few days later a second radiograph showed the shadow to be much smaller and a third exposure a week later did not show any shadow at all. The patient was thereupon discharged from the hospital as cured. But about two weeks after his discharge he began to complain of cough after swallowing liquids and shortly thereafter regurgitation of the ingested fluid with copious mucus. The patient's family physician sent him to Dr. Guttman for further examination. Bronchoscopy under local anesthesia revealed no pathological condition. During esophagoscopy, however, at a distance of about ten inches from the teeth a sudden resistance was encountered. The lumen of the esophagus appeared narrowed down to a slit. Diagnosis of neoplasm of the esophagus was made and x-ray examination showed that the patient was suffering from stenosis due to neoplasm with a fistulous communication into the right bronchus.

DISCUSSION.

DR. FREUDENTHAL said that a few days ago, by mere chance, he saw at the Montefiore Hospital two specimens, one of them showing a big communication between the esophagus and bronchi, so large that one could put a finger through. The patient had a carcinoma; the other patient showed a very small fistula only.

DR. GUTTMAN said that the case was almost unique. There was only one other case reported in the literature in which the diagnosis was made *intra vitam*. That case was reported by Horner. There are many cases where the diagnosis was made *post-mortem*. The changes in the lung were probably brought about by the food ingested. The hemorrhage was probably caused by the erosion of the carcinoma.

DR. MCCOY said that while he did not have a case of malignant connection between the esophagus and bronchi, he had reported a case of syphilitic fistula, in which he presumed that a gumma had taken place, broken down and healed; he had been asked to go to the N. Y. Hospital and pass an esophageal tube, and the tube went from esophagus into the bronchus. The esophagus was absolutely occluded.

Report of Removal of the Root of a Tooth From the Right Lower Lobe Bronchus, Impacted for Three Months. X-ray. DR. JOHN E. MACKENTY.

DR. MACKENTY said that he would not have brought this matter before the Section had it not been a rather unusual case. Foreign bodies are not infrequently removed from the lung, but in this instance the foreign body had been in the lung for three and a half months. The man had had a number of teeth extracted, and immediately afterward was taken with fever and cough, and had symptoms of tuberculosis, and the doctor in attendance even stated that tubercle bacilli were found in the sputum. He was sent to Saranac, N. Y., but Dr. Kinghorn there could not find

the tubercle bacilli. An x-ray picture was taken, which was shown on the screen. The patient brought with him the picture taken in the Adirondacks, but Dr. MacKenty had others taken by Dr. Caldwell, and they showed the root of a bicuspid lying between the 4th and 5th ribs, in front and just at the edge of the cardiac shadow. An anesthetic was administered by Dr. Bennett.

Dr. MacKenty said he went into the right bronchus and then into the various openings and finally, on looking into the posterior branch he saw a lot of granulation tissue and by bending the patient forward he got the end of the tube into the posterior branch of the lower lobe. The bleeding from the granulation tissue was considerable. It was fortunate that the bronchoscope had a light in the upper end. The one used was a modification of Brunings. When the granulations were removed, the root of the tooth could be seen lying three-fourths of an inch inside of the posterior lower lobe bronchus, and was easily extracted. The man was in the hospital only a week, and got rid of his cough before he left. A letter was recently received from him saying that he was as well as ever.

DISCUSSION.

Dr. McCoy said that in a young child it is always wise to think of tracheotomy. In a case which he had seen, the child had swallowed a foreign body and there was such a large amount of edema of the larynx that it was impossible to get in at all. That is apt to be the case with young children. At the first sign of dyspnoea a tracheotomy should be resorted to rather than an attempt to go down through the larynx.

In reply to an inquiry from Dr. Quinlan as to whether there was any emphysema, Dr. MacKenty replied in the negative. From what he could make out, the breathing-sounds were diminished. He did not think the obstruction was absolute.

Dr. MacKenty partially agreed with Dr. McCoy. Some time ago he had tried to remove a foreign body, and the child became cyanotic, and he had to do a tracheotomy; when he went in, he found nothing; then he reversed the bronchoscope and found a peanut shell in the larynx. It is better to do a tracheotomy if by so doing the operation is made easier and shorter. Prolonged endobronchial examinations in young children are dangerous.

Dr. Heller told of the case of a child of sixteen or seventeen months who, while sitting at the table, got a piece of fish vertebra into its larynx. It was dyspnoeic, and just as the tube got into the larynx the child stopped breathing. Immediate tracheotomy was performed and the foreign body found up under the true cords. Beyond the body of the bone there was a little prolongation which caught into the mucous membrane of the sac and allowed the flat part to bap up and down like a valve. The end of the tube got in against that and shut off all the child's air. The child had oedema of the glottis, but got over that and died later of pneumonia.

Dr. Duncan MacPherson asked whether it would not be advisable to postpone tracheotomy until indications of obstruction made their appearance in preference to anticipating such indications by doing a preliminary tracheotomy, as suggested by Drs. McCoy and MacKenty. Another objection to a preliminary tracheotomy was that a tube in situ interfered with a view of the field. Tracheotomy could be done if the need arose, and submitting a patient to the danger incidental to tracheotomy as a

routine measure in cases of laryngotomy and bronchoscopy did not seem advisable.

DR. FORBES, referring to oedema of the larynx after bronchoscopy, said that it had not been his experience with twelve or fifteen children. He did not hesitate to use a tube larger than Dr. Jackson indicates in his recent book. He had anticipated oedema in his cases, but so far that had not been the bugaboo. In his first case, he did not have sufficient confidence, and did a preliminary tracheotomy; the patient died, some six weeks after from complications. He did not want to go into the trachea unless it is absolutely necessary. That is the position the men would like to assume who are doing bronchoscopy. He would not hesitate for a moment to do a tracheotomy, but all agree that as one's experience broadens, the number of cases in which tracheotomy is necessary becomes less and less. His experience does not coincide with those who spoke of oedema occurring with sub-glottic cases. In removing an upholsterer's tack which had been embedded in the lung for some months and the inflammation was followed by stricture, it was necessary to manipulate and work for fifteen to seventeen minutes, and a No. 7 tube was used, but there was absolutely no reaction in the larynx; child was 4 years of age. Operation was twice performed, with an interval of ten days. The case was carefully watched, and instructions were given for the necessary procedure, if required. He was going to put in an intubation tube. There was only one introduction of the tube at each sitting and that was done with no trauma of the larynx itself. As one's technique improves and one gets into the larynx without injury to the cords, he will do better work and it would seem the tendency to oedema is lessened.

Impacted Foreign Body in the Trachea. DR. C. J. IMPERATORI.

(To be published in a subsequent issue of THE LARYNGOSCOPE.)

Report of Unusual Findings in a Case of Radical Operation for Pan-sinusitis. DR. JOHN MCCOY.

The patient was 47 years of age and came from the South. He was first seen by Dr. McCoy last March (1915). He then gave a history of having had for five years a persistent suppuration in both nostrils. Occasionally the left nostril would seem to dry up, only to reappear again. The suppuration in the right nostril was practically continuous. The symptom which led him to consult a physician was persistent, severe headache, practically without intermission for five years, and he was almost on the point of suicide. He had had five different intranasal operations.

On examination the nose showed the signs of the various operations, and pus was streaming from all the accessory sinuses. Accordingly, a radical Killian operation was planned for the right side; with the history that the left side occasionally dried up, it was thought that conservative measures might relieve that side. On the 12th of March, after having an x-ray picture made which apparently revealed nothing but a chronic suppuration of the accessory sinuses, the right frontal sinus was opened. The usual incision was made, taking away the anterior wall of the frontal sinus; a probe was then inserted, with the expectation that it would come out through the right side of the nose, but this it failed to do; it apparently lost itself, until presently after several moments it was

found passing down into the left nostril. There was absolutely no communication whatever of the right frontal sinus with the right side of the nose; there was a thick, dense, lower wall, with no communication with the ethmoid on that side, and the right frontal sinus was a part of the left frontal sinus, so a double radical operation had to be performed. Both frontal sinuses were cleaned out, as well as the sphenoids and ethmoids, and an intranasal opening was made in the antra. In seven weeks the man went home cured.

It seemed to be an interesting case for a report, for the man had had five different intranasal operations, and all of the operators had tried to get up in the right frontal sinus, and one thought he had penetrated the sinus. If undue force had been used, one could easily have gone into the brain and started up a meningitis. The x-ray picture did not suggest the condition found, nor did Dr. Caldwell, the x-ray photographer, mention it.

DISCUSSION.

DR. CARTER said that in Logan Turner's book, he states that such a thing as communication between the frontal sinuses is almost unknown, and that in all the cases where apparently there was only one naso-frontal duct if one searches far and is careful he will always find the other duct present.

DR. LEWALD said that if stereoscopic plates had been made one might have been able to tell the condition of the septum. He was not sure, however, that it could have been done. In such a case as this where there had been so many operations, it would have been well to have had stereoscopic roentgenograms.

DR. HELLER said that Dr. McCoy's case reminded him of a case seen early in his experience. A man was brought into the hospital with his right eye closed, and marked protrusion downward and outward. On opening up the case, it was found that pus had burrowed through the floor of the orbit; the abscess was in the frontal sinus. Practically a Killian operation was performed. He probed for a naso-frontal opening, but found none. The man had been treated outside and was in pretty bad condition, so after working for twenty minutes, he stopped. The condition cleared up, leaving a small fistula, which later healed, and the man left the hospital. A few days after the operation, the nose was examined thoroughly, and seemed to be as nearly normal as one could wish. However, the anterior tip of the middle turbinate was removed, and an effort was made to get in from below but without success,

The man was apparently well for a year, and then came back, and Dr. Lederman saw him in consultation. He then had a swelling over the eye, though not so large as before. It was decided to operate again, and it was easy to open up the old wound. Dr. Fridenberg assisted in the operation, but again no opening into the nose could be found. It was apparently a blind sinus. There was no pus, and no discharge from the nose. A false opening was made into the nose through the ethmoid cells, and a half years ago. So far as could be determined, there had been drainage established, and the man has been well since. That was three no communication between the sinus and the nose.

DR. MCCOY said he was convinced the man had no unbound cell as he healed up so readily.

